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T H E  
*Physician's Pulse-Watch;*

O R, A N

E S S A Y

To Explain the Old Art of FEELING the  
PULSE, and to Improve it by the help of  
a PULSE-WATCH.

In Three P A R T S.

- I. The Old *Galenic* Art of Feeling the Pulse is describ'd, and many of its Errors corrected: The true Use of the Pulses, and their Causes, Differences and Prognostications by them, are fully explain'd, and Directions given for Feeling the Pulse by the Pulse-Watch, or Minute-Glass.
- II. A New Mechanical Method is propos'd for preserving Health, and prolonging Life, and for curing Diseases by the help of the Pulse-Watch, which shews the Pulses when they exceed or are deficient from the natural.
- III. The *Chinese* Art of Feeling the Pulse is describ'd; and the Imitation of their Practice of Physick, which is grounded on the Observation of the Pulse, is recommended.

To which is added,

An Extract out of *Andrew Cleyer*, concerning  
the *Chinese* Art of Feeling the Pulse.

By SIR JOHN FLOYER, Knight.

LONDON, Printed for *Sam. Smith* and *Benj. Walford*, at  
the *Prince's-Arms* in *St. Paul's Church-Yard*, 1707.

43338





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T O T H E  
Q U E E N .

MADAM,

**T**HEY who take a general View of the Wonders of Your MAJESTY'S Reign, may think every Thing below Your Notice, that has not some relation to the astonishing Events which render Your MAJESTY more Glorious than any of Your Contemporaries or Predecessors.

A 2

But

## *The Dedication.*

But if we consider the more private and retir'd Virtues which adorn Your MAJESTY'S Life, we may find that all laudable Endeavours, tho' of an Inferior Nature, as they are useful and advantagious to Mankind, have their share in Your MAJESTY'S Observation and Encouragement.

This makes me presume to lay the following Papers before Your MAJESTY; in which I have drawn together, from the most remote Ages and Countries, such Remarks, as may, I hope, be useful to those who are born in Your MAJESTY'S Dominions, by contribu-  
ting

*The Dedication.*

ting to make those Lives long, which You have made happy; and to give Rules for Health, without which we can have no Relish even of those extraordinary Blessings that are deriv'd to us from Your MAJESTY's Reign.

I might here inform Your MAJESTY, That the Author I have made most use of in this Treatise, obtain'd the Favour of three *Roman* Emperors, by his Labour on the same Subject; and that an Emperor of *China* did not think it unworthy of Him, to write a Book upon it.

*The Dedication.*

But Your MAJESTY's great Goodness and Humanity wants no Excitements from Examples of this nature, it being the Glory of Your MAJESTY's Reign, That Your MAJESTY does not only surpass Your Great Adversary in the Progress of Your Arms, but also in the Encouragement of Arts. *I am,*

MADAM,

*Your Majesty's most Faithful*

*and Obedient Subject,*

JOHN FLOYER.

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T H E

# P R E F A C E.

**I** Have for many years try'd Pulses by the Minute in Common Watches, and Pendulum Clocks, when I was among my Patients; after some time I met with the common Sea-Minute-Glass, which I used for my Cold Bathing, and by that I made most of my Experiments; but because that was not portable, I caused a Pulse-Watch to be made which run 60 Seconds, and I placed it in a Box to be more easily carried, and by this I now feel Pulses; and since the Watch does run unequally, rather too fast for my Minute-Glass, I thereby regulate it; and add 5. or 6 to the Numbers told by the Watch: I also made a half Minute Glass, whose Case turns like a dark Lanthorn, and that was portable, and useful in feeling of my Patients Pulses, but that differed 4 beats from the Minute Glass, which I always kept at home as my Standard. After I had found this useful Measure for Pulses, I read over all

## The Preface.

that Galen had writ about the Pulse, which I epitomis'd, and Corrected many of the old Errors, especially the old Notions about the Causes of the Pulse. After by my Pulse Watch I had found the most healthful Pulses, I easily discern'd what were the exceeding and deficient Pulses. 'Twas easie for me to take Indications from the hot or cold Pulses, and Cacochymias found out by the Pulse Watch, and to cure them by a contrary Regimen; the exceeding Pulses I learnt to reduce to their healthful state by the cold Regimen, and cool Tastes, and the deficient Pulses, by the hot Regimen and hot Tastes of Medicines. After I had reflected on what I had done I found my Notions hit with the Chinese Practise, about which I consulted many Printed Travels, but could never procure Cleyer's Specimen Medicinæ Sinicæ, till these Papers were Printing: I found in Galen all the useful and sensible Phœnomena about the Pulses, which I Collected and Explain'd according to the new Anatomy, and our present Philosophy.

The Greeks used their ars Σφουρικὴ for Prognostications chiefly, and also a part of the Semiotica; but the Chinese also have made that a part of their Therapeutics, as well as of the other; for from the Pulse they take their Indications for cure, in which they excell'd the Greeks. I cannot but acknowledge the Industry  
and

## The Preface.

*and great Ingenuity of both Greeks and Chinese; but must declare, that I think both wanted a certain Rule or Measure by which they might know the natural Pulse, and the exceeding and deficient Pulse which depend on that, and for want of this Rule their Art is but a fair Conjecture; but by my Measure many Diseases, if not most of those which lie in the Blood and Animal Spirits, will be known, and the Indications taken from the Pulse are certain and obvious.*

*Tho' neither the Greeks nor the Chinese knew the true Fabrick of the Organs of the Pulse, nor their true action and uses, nor the Circulation of Humours, and the causes of it; yet the Greeks discovered the Pulses of all Diseases and Humours, and Passions: And the Chinese founded their Art of Pbysic on the Pulse and its differences; when more quick, great, frequent, was obvious to, the touch; and this produces the hot Diseases, and the contrary Pulses were evident which produced the Cold. The Cacochymias were the causes of all Diseases with the Greeks, but because those cannot explain all Diseases, and they are sometimes very obscure, or much mixed with one another: I shall endeavour to adjust the Cacochymia to several numbers of the Pulse, by which they may be known, and will prefer the Chinese Practice to that of the Greeks as  
most*

## The Preface.

most obvious and certain, and short, and assert that upon that we may build all the Practice of Physick. I can find by the Index in my Clock that it goes too fast, or too slow, without knowing the Mechanism of it, and I can add to, or take off the Weights, to regulate its Motion when it exceeds or is deficient; so it happens in the practice of Physick, our Life consists in the Circulation of blood, and that running too fast or slow, produces most of our Diseases. The Physician's Business is to regulate the Circulation, and to keep it in a moderate degree, suppose once in three Minutes; if it run oftner or slower, our Mechanism is out of order; but 'tis not necessary for us to understand the Motions of the Particles in the Blood, nor the Texture of the Viscera and Organs; 'tis enough that I know by a hot Regimen and hot Tastes I can raise deficient Pulses, and by a cold Regimen and Medicines of a cool Taste, I can depress and sink the number of exceeding Pulses. By this Method all fine Hypotheses will be excluded from Practice, and a more certain and sensible Foundation will be laid for it; and we may give liberty to every Physician to talk what Philosophy pleases him best, we can never disagree in this, whether the Pulse exceeds or is deficient, and whether a hot or cool Method must be pursu'd; the greatness of the Disease, the strength of the Patient, and the quantity  
of



## The Preface.

of the Medicines, as well as their qualities, will be known by the Pulse, and all the old Method of Practice and Rules for cure by contraries, will be comprehended under these two general Indications of stopping the Pulse or Circulation when they run too fast, or promoting them when they move too slow.

I have long since imbibed this Notion about Physical Matters, that our Senses can sufficiently inform us of all the most useful Phœnomena whereby we know or cure our Diseases, or prognosticate concerning them. I have formerly shewn the usefulness of Tasting and Smelling for discerning the nature of Animal Humours, and the qualities of our Medicines which we use in curing of them: But in these Papers my Design is to discover what Advantages Physicians may have by a right use of the sense of Feeling. Painters very much improve the sense of Seeing by observing the great Varieties of Colours: Musicians improve the Hearing by observing the difference and proportion of Sounds; and Galen will teach us to know the several dimensions of the Artery, the Contraction as well as Dilution, and the Rithmus or Proportion betwixt them; and he positively affirms, that it will require some years to be able to discern the Contraction of the Artery, and a long Experience to distinguish a moderate Pulse, and the excesses and defects from it.

Aristotle

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Aristotle, de anima, chap. 9. observes, that Mankind, of all Animals, has the most exquisite Touch, and that in the niceness of that he exceeds all other Senses. I cannot find any other Subject more fit to try the nicety of our Feeling than this of Feeling the Pulse, by which we may discern the greatness and smalness, the strength and weakness, the celerity and slowness, the rarity and frequency, the inequality or equality of the Pulse. I very much admire the diligence of the Ancients in distinguishing the uses and actions of the Pulsifick Faculty, tho' they ingeniously confess, they knew not what that was which produc'd the Pulse. 'Twas very difficult for them to get a true Idea of a natural Pulse, and so to retain and apply it for the measuring all defects and excesses by it in several Constitutions; and 'tis almost impossible to know whether a Pulse be more quick and frequent than ordinary, without a measure: These difficulties made Celsus so severe a Critick when he says, Venis maxime credimus fallacissimæ rei, because they are alter'd by so many Causes, Age, Sexes, Constitution, Baths, the Sun Passions, and the first coming of the Physician alters the Pulses, so that then we ought not to feel the Pulse; and we find that in the beginning of Fevers the Pulse is slow, but Celsus only cautions us that we do not believe a Person to be in a Fever by the celerity and frequency

of

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of the Pulse, because the Pulse may impose on us when moved so by external Accidents, quas venas conspectus medici movet quam mille res turbant ; but this is a usual caution amongst the Galenists, to observe that no external Accident disturb the Pulse before we judge of the Disease ; and if there be any alteration to expect till it ceases, which it will soon do. 'Tis a great wonder to me that Galen did never count the Pulse, since by the exceeding Pulses we may well know Fevers, and the hot Intemperies and hot Cacochymia : And by the deficient Pulses we may know the cold Intemperies of parts, and the cold Cacochymia : As the Blood moves faster it produces the Choleric Cacochymias, and as it moves slower the Pituitous.

Not only the Cacochymia will be discerned, but also the several natural Constitutions which shall be distinguish'd by the four secreted Humours, Choler, Salt Serum, Phlegm, and Succus Melancholicus ; and the four compound Constitutions are when a plumpness is joyn'd with Choler, that is, the hot and humid ; and when Salt Serum and Leanness are joyn'd, then the Constitution is hot and dry : If Phlegm be joyn'd with Plumness then 'tis a Constitution cold and moist, or humid ; but if the Body be Lean and Melancholy, then the Constitution was call'd cold and dry : By the hot  
and

## The Preface.

and cold the Ancients understood the different Rarifications of our Humours, and by the dry and moist they meant the different quantities of Nutritious Humours, and all these they discern'd by the sense of Feeling, but I shall distinguish them by the several numbers of the Pulse: Not only the Cacochymias but most other Diseases may be distinguish'd by the Pulse; so by the number 100 I know all sort of Fevers, Pains, Defluxions, if very great in young healthful Bodies, tho' Children will have more, and old Men fewer, about 80; the Reasons of this alteration is, that if the Pulse of the old be about 60, 20 Pulses excess will make them in a Fever; and because the Pulse of Children is very frequent, naturally about 80, we must add 20 or 30 Pulses to make it a Fever Pulse. A hectick Fever has the same number as other Fevers, but we must distinguish them by the smalness of the Pulse: In most Inflammations the Pulse is hard, in cold Diseases the numbers are deficient, and the Pulse is undose, in hot Diseases vibrating, in great Evacuations Formicant or Vermiculant Pulses: The lowest Pulse I have counted is 55, the highest 132 in an hectical Habit, in an obstruction of the Menses at 17 years, 'tis certain fewer may be counted, and more; but 'tis not easie to discover the greatest or fewest numbers that may happen. I have given a few  
Instances

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*Instances how far some Diseases will be known by the Pulse; more particular Instances the Reader will find in the Chapter of the alteration of the Pulse in Diseases; and he will find in the preceeding Chapters how the Non-naturals alter the Pulse; upon that Experience is grounded this Assertion, that the hot Regimen will cure deficient Pulses, and the cold the exceeding: By curing, I mean by reducing the Pulse to its natural numbers. That which is chiefly to be cur'd is the preternatural state of the Blood and Spirits, these two are the immediate causes of the alterations of the Pulse, because they are the continent causes of the healthful Pulses. The Blood and Spirits are either too much rarifi'd and mov'd, or too much condens'd and slow in their Motion: For the first we prescribe Contraries, such is the cold Regimen; and for condens'd Humours, and obstructed Motion, the hot Regimen: And our frequent Experiences assures us, that by these Methods we shall reduce the Pulse to its natural numbers; from whence we may infer, that we have cur'd the preternatural state of the Blood and Animal Spirits. 'Tis a biting Reflection Sir William Temple has given Physicians in his Essay upon Health, p. 149. Dr. Harvey gave the first credit, if not the first rise to the Opinion about the Circulation of the Blood, which*

*was,*

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was expected to bring in great and general Innovations into the whole Practice of Physick, but it has had no such effect: I'm satisfy'd that Dr. Harvey did design a Tract about the Pulse, as he intimates, which if he had done he would have pursu'd his Scheme, and drawn it into Practice. I hope what I have done will excite the young Physicians to improve this Subject, which will be very useful, by improving the Notion of many Diseases, and will reduce them to a Circulation too slow or too fast, and we shall discover hereby the true and real effects of all Specifics, as they either stop or accelerate the Pulse. I hope the Reader will Friendly correct my Mistakes, and tho' I be insulted with the Ridicule of many Learned Men, as I was at first for my Book of Cold Baths, yet in time they will allow this Tract may prove very useful, as well as the other.

T H E

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## C H A P. I.

*Concerning the old Galenic Doctrine  
about the Pulses, and the erroneous  
Notions maintained by it.*

**H**ippocrates was not ignorant of the nature of the Pulse, as appears by his Writings; and Galen affirms that he first called the Pulse *σφυγμι*; but Galen himself was the chief Inventor of the Art *σφυμική*, and he writ 14 Books about it.

*Hippocrates*, in his Book of Humours, directs us to observe the Pulse among other Signs, and he calls them *σφυγμι*, by which Name some of the Ancients described the Pulse when 'tis vehement in inflamed Parts, 'till *Hippocrates* called all Motions of the Arteties the Pulse. In the *Coactæ Prænotiones Hippocrates* mentions the Pulse in the Neck in Fevers; and in the same Book the Pulse in the Head in Fevers. He there also mentions the Pulse of the Lethargick (*σφυγμισι νωθροισι*); and in his

Book of Diet, he observes that the Pulse and Breathing are proportionable to the Age of Persons, and that they are Signs of Health and Diseases, (a). And in his Book of Womens Diseases, he describes the Pulse of a Child-bed Woman when the *Puerperia* stop, see (b). And in the Fourth of the Epidemics he calls the Pulse in high Fevers quick and great, see (c). And in the same Section he mentions a trembling and slow Pulse, see (d). And in the Second of the Epidemics there is this Observation, If the Pulse be very evident in the Arm, 'tis a Sign of a *Mania*, or great Anger.

I have given all these Instances to prove that *Hippocrates* advised us to observe the Pulse, that thereby we might know both our Health and Diseases, and might also make Prognostications concerning the event of them.

*Galen* has writ very largely about the Pulse its Causes and Differences. I here think fit to give a short Scheme of his

(a) Φλεβῶν διαρύξεις, ἢ ἀναπνοὴ πνέουσα καθ' ἡλικίαν, ἢ σύμφωνα ἢ διάφορα, ἢ νόση καὶ ὑγιέως σημεῖα.

(b) Σφυγμοὶ βληχεροὶ, ἢ ὅτι ὄξεις, ἄλλοτε αἰετόμυροι, ἄλλοτε ἐλίποντες.

(c) Τοῖσι ὄξυστατοῖσι τῶν πυρεθῶν οἱ σφυγμοὶ πυκνότατοι καὶ μέγιστοι.

(d) Σφυγμοὶ τεταράχτες καὶ τρεμάροι.



Doctrin about the Pulse, and to make some Remarks on the several Errors in his Notions and Anatomy. And in the following Chapter I will describe the true Causes of the Pulse, according to our modern Anatomists.

1. *Galen* believ'd, That the Heart and Arteries dilated themselves like a pair of Bellows, and drew in the Air and Blood, and that by their contractions they expelled the fumes; and that the Heart and Arteries opened and contracted at the same time, and moved together. This Hypothesis is contrary to Experience and Anatomical Observation, by which it appears that the Heart contracts when the Artery is dilated.

2. *Galen* asserts, That the right Ventricle of the Heart draws in the Blood from the *Vena Cava*, and the left Ventricle Air from the Lungs, and that in the contraction of the Heart the Blood passes thro' the *foramina* in the *septum medium* of the Heart; and that in the left Ventricle the Animal Spirits were made, and thence distributed through the *aorta*; this vital Spirit was called the *calidum innatum*, and *Hippocrates* thought it to be the Soul, of a nature like Light, produced from the Air and thin pure parts of the Blood.

3. The old Writers believ'd that the Heart gave the Heat to the Blood, and not the Blood to the Heart, which is contrary to Experience; and 'tis contrary to our modern Philosophy to believe with the Ancients, that the Blood and Humors were moved by attraction, since all motion of them is by propulſion. *Eraſiſtratus* and *Aſclepiades* had got the true Notion of the motion of the Blood, for they aſſerted, That the Arteries did not move of themſelves, but by the Impulſe of the Heart, which injected Blood to diſtend them. But the common Opinion was contrary to them, *Non quia implentur Arteria diſtenduntur, ſed quia dilatantur Arteria, implentur ut folles.*

4. *Galen's* Opinion, That the vital Spirits were generated by the Heart is true if fairly explained, becauſe by the Pulſation of the Heart the Circulation and Diſtiſtion, and Rarification of the Blood are manag'd, and by a long circulation the Air which is contained in the Blood (as well as in all other Fluids) is very much rarified, and the volatile parts of the Blood by joining with that are ſpiritualiz'd, and from this mixture of hot rarified Air, and the volatile Oil and Salt of Blood diſtilled in a thin, clear *Limpha*, the  
Ani-

Animal Spirits are generated, when fermented through the Glands of the Brain. This is the first use the *Galenists* ascribed to the Pulse.

5. The other use of the Pulsation was performed by the contraction of the Arteries, by which all Fumes were believed to be expelled, and this use we explain thus: The several Secretory Glands separate some Humour from the Blood, such as Choler, Spleen-Juice, Salt *Lympha*, Milky *Lympha*, Urine and Sweat, and many hot Fumes pass through the Lungs and Pores of the Skin.

By the preceeding Account 'tis plain that the Ancients knew the true uses of the motion of the Heart and Pulse, *viz.* The generation of vital Spirits, and the expulsion of Excrements, tho' thro' ignorance of the causes of these motions they ill explained the manner of the motion of our Humours, and attributed them to attraction; but this Error, since it was discovered, has not much altered the practice of Physick, because the old Physicians allowed a motion of our Humour as well as the Moderns, but they knew not the circulation of them.

6. We were taught by *Galen*, That we must admit nothing relating to the Pulse

but what we evidently feel; but I cannot but believe his Fancy imposed on him when he asserts, that he felt the contraction of the Artery, which he endeavour'd to prove, because the Artery makes an Impression in the Pulp of the Fingers, and he thought he felt the receding of the Artery from that Impression; but 'tis plain that we can discern no more in a natural Pulsation than the Stroke given to the Finger, and the interval betwixt each stroke by the numbering of the Pulse in a minute, whereby we discern when the Intervals are longer or shorter.

7. The distinction of two Intervals was too curious, and not useful, the interior quiet betwixt the contraction and distention of the Artery is sensible, but the exterior betwixt the distention and contraction is insensible; and 'tis allowed that we cannot discern the beginning of the distention nor the end of the contraction, 'tis enough to consider the Intervals betwixt the Pulsations.

8. The old Writers considered the proportion of the Celerity of the *Diastole* to the *Systole* of the Artery, and they called it a *Rythmus*; and they also observed the proportion of one Rest to another, or of the Rest to the Motion; and some Pulses,

ses, they said, had a good *Rythmus*, and some were without a *Rythmus*; but all this is too curious and not useful; these are Musical and Geometrical Notions, which were adapted to Physick formerly, but not true sensible affections on our sense of Feeling, and therefore must be rejected.

9. The old nice Observations about the Dimensions of the Pulse were useless, tho' taken from Geometry; such are the long and broad, and narrow and deep, and short Pulses; these are not any of the natural Phænomena.

*Galen* considered the motion of the Pulse as a Geometer would do, in respect of the space, the Pulse is great or small, in respect of the time of the motion the Pulse is swift or slow, in respect of the Interval 'tis frequent or rare; and he largely treats of the Inequality and Equality of the motion of the Pulse; but these Geometrical Notions caused a great Error in reckoning up more Pulses than were sensible. He complains of some Physicians in his time who drew all they had learnt in Musick into their Treatise about the *Rythmus* of Pulses; and the same fault he commits about the great and small Pulses, when he makes nine differences of the Pulses, reck-

oning three to each of the three Dimensions and describe the Longitude, Latitude and Profundity of the Pulse, and at last reckons up 27 Differences of the Pulse in respect of the magnitude.

10. The moist and dry Pulses are not perceptible, but may be supposed to be the hard and soft, and the hardness does not depend on the hardness of the Skin of the Artery, as the old Writers supposed, but on the fulness or obstruction of the Artery in Inflammations and Pains, or on the Schirrosity or Constriction of the solid Parts, as in the Tympany, or any compression, by which the circulation is stopt in some Parts.

11. What *Galen* says about the difference of Pulses from the use urging, must be explained by the different irritation given to the right Auricle of the Heart, by the quantity and rarification, or acrimony of the Blood and Spirits.

12. The old Writers mention the Pulse *Imparcitatus*, when the motion of the Artery beats slow in the beginning, and is after soon finished, or the contrary. They also affirm, that in Fevers the distention of the Artery begins and ends quick, and grows slow in the middle; and these seem to me the Dreams of Ingenious Men.

13. Hot

13. Hot and cold Pulses were reckon'd among the difference of the Pulses; 'tis true, in the Hectical we feel a Heat in the Artery, but no more Cold appears there than in the rest of the Body.

14. The *Pulsus Serratus* was describ'd by the distention of the Artery, in some places more than in others; and generally the old Authors mistook in nothing more than about the inequalities in one Pulsation, which seems to me impossible, because our feeling cannot discern such Motion and Difference in our Artery which never happens: For at the same time the Heart is contracted, and felt on the side, the Blood is injected into the Artery; and the Pulse is felt in the Extremities, and the Blood runs equally thro' all parts of the Artery with the same Force and Celerity. If any inequality happen, it must be from the regurgitation of the Blood, when the Artery is obstructed as in pleuritick Pains; the serrate Pulse is observ'd.

15. It was the Opinion of the *Galenists*, That the Heat retires in Sleep, which must be thus explain'd, the Perspirabile is evacuated by the warmth of the Bed, which reduces the Pulse to its natural State towards Morning, after all Secretions

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ons are perfectly made, and then the Pulse grows lesser and slower, and more rare.

16. The old Writers make the Celerity of the Pulse the only Sign of a Fever; but to that we must add the greatness and frequency, if the Fever be not Malignant; and I also find the number of the Pulse to be a certain Sign.

17. We cannot know the Antecedent Causes of Diseases by the Pulse, so a formicant Pulse shews a defect in Circulation, but not the Cause which occasions it, *viz.* that happens by Poisons, Plague, and hot Baths, which produce that kind of Pulse; so it is in the vermicular Pulse, which also shews that the Circulation fails, but not the Cause of that Pulse. *Galen* attended other Circumstances, of which the Pulse cou'd not inform him in discovering of some Distempers, or their Causes; for he, by mentioning the Name of *Pylas* to a sick Woman, found some alteration in her Pulse, by which he discover'd her Love-Sickness; and he guess'd at the Pleurisy in *Glauco*, by the *Malsum* which stood in the Window.

By this Instance it appears, That the old Physicians did not trust to the Pulse in all Diseases; but they took Notice of all other  
other



other Signs, how they agreed with the Pulse in distinguishing Diseases : So by the Pulse we may know that any Person has some Pain or Inflammation, but by that we cannot tell in what part that is. By the Pulse we may know Evacuations, but 'tis not possible to determine whether 'tis by the Menfes, or other Hæmorrhagies, and 'tis Disingenious to pretend to know by the Pulse that which cannot be discover'd by it : And 'tis a great want of Diligence or Perverseness not to enquire thoroughly what may clearly be known by the Pulse alone, or not to own what others by a long Experience have discover'd. It was an erroneous Opinion in *Sanctorius*, that we could not know the Coction of Feverish Humours, nor the peccant Humours in Diseases by the Pulse, for this is contrary to *Galen*, who says, Πάχους χυμών ἢ πλῆθους ἢ γλιχρότης ἢ δριμύτης σφύγμους ἀλλοιῖν δύναται, Lib. I. Of the Causes of the Pulses, Chap. I.

We observe in many Inflammations that the Pulse is hard, in cholerick Cases vibrating, in Dropsies soft, in good Digestions the Pulse is strong, in Rarifications of the Spirits the Pulse is quick and frequent, and in the chilness of them the contrary slow and rare.

*Galen*

*Galen* rejects the full and empty Pulses, because he believ'd that the Artery was not fill'd with Blood, but with fumes and aerial Spirits, tho' in his Tract about the use of the Pulse, he says, he could bleed an Animal to Death, by cutting any small Artery; and on this Experiment he grounds his Assertion, that there is a Communication between the Veins and Artery: And he also observ'd the *Valves* in the beginning of the *Arteria Aorta*, so that he was not far from the discovery of the Circulation, but he was prejudic'd by the old Notion, that the Parts attracted the Humours, and that nothing was in the Artery but Spirits, and that the *Facultas Pulsatilis* moves the Artery as well as the Heart, but he ingeniously confesses that he knew not what that Faculty was.

I cannot but observe, That *Galen* brings too much Logick into his Treatise of Pulses, and mentions the Predicaments, and pretends to proceed in a Logical Method from general Notions, which swells his Treatise about Pulses, and making it less useful, and very obscure; but that short Epitome he writ, *ad Tyrones*, is well worth any Physicians Reading, being less mixed with Logical and Geometrical No-

tions

tions, which are not so useful in Physick as sensible Observations, deliver'd in plain Sense without Terms; but that was the Mode of the *Greeks* then, and *Galen* then blam'd the School of *Moses* and *Christ* for want of Logical Demonstrations in their Discourses of Laws, and he is fond of a general methodical Discourse about the difference of Pulses.

Since *Galen's* time, till *Harvey*, this Art of feeling the Pulse, as to its false Notions in it continu'd the same; but since the Circulation of the Blood has been discover'd, *Harvey*, *Lower*, *Borellus*, *Bellinus*, and *Malpighius* have explain'd the Instruments and Causes of the Pulse, better than the *Galenists* had done; but we are still oblig'd to *Galen* for all his useful Observations about the Pulse. All I pretend to is the discovery of a Rule whereby we may know the natural Pulse, and the Excesses and Defects from that in Diseases; and from the Pulse we may take our Indications for the use of Diet and Medicines, as I shall prove hereafter.

## C H A P. II.

*Concerning the Pulse in general, its Nature, true Use and Causes.*

**T**HE Pulse is that sensible motion which is given to the Artery by the Blood, which the Heart injects into it.

The *Facultas Pulsifica* of the Ancient Writers is the Mechanical Contrivance of the several Parts which help and promote the Circulation, *viz.* the solid Parts are the Heart, whose Fabrick is muscular, the Arteries and Veins are continued Canals, the Organs of Respiration are in continual motion and compress the Veins, the Nerves are inserted into the Muscles of the Heart, and those for Respiration, the fluid Parts and the Blood, whose Particles have a globular Figure, and that continually moves through the circulatory Organs, and variously irritates them; the other Fluid is the Animal Spirits which move through the Nerves, and gives motion both to the Heart and Lungs.

Neither

Neither the Heart nor the Arteries have any power of moving themselves, but the flux of the Animal Spirits thro' the Nerves into the muscular Substance of the Heart is the first cause of the Circulation of our Blood, whose reflux to the Heart is promoted by the Respiration which presses by the descent of the Diaphragm, the Blood in the *Vena Cava* up to the right Auricle of the Heart, which being filled is stimulated to inject the same into the right Ventricle, and that immediately injects the Blood thro' the Lungs into the left Ventricle, and by the constriction of that the Blood is injected into the Arteries.

That part of the *Vena Cava* which joins to the right Auricle has muscular Fibres by which it forces the Blood into the right Auricle, which is always bigger and of more use than the left, whose office of injecting Blood into the left Ventricle the motion of the Lungs performs.

The Arteries are distended successively by the Blood as it passes through them; and that Impulse given to them distends and vibrates them to make an Impression on our Fingers, and that differs according to its Strength, Magnitude, Celerity, Frequency and Equality.

The

The motion of the Blood through the Arteries is compared to that of Water injected by a Syringe through a Pipe or Gut, and the pressure by the Syringe answers to the pressure given to the Blood by the constriction of the Heart.

The Arteries are thought to contain the 5th part of the Blood, if the whole Mass be 20 pound, 5 pound is in the Arteries, and the rest in the Veins. And *Borrellus* asserts, that the circulation is performed in 3 or 4 minutes, and 20 pound of Blood is circulated 16 times in an hour. *Lower* supposes that 2 ounces of Blood pass in every Pulsation, and that there is 2000 Pulses in an hour, and then the Blood circulates according to his computation 13 times in an hour.

Others suppose that 3 ounces of Blood is injected into the Arteries at every Pulse, which cannot fill them, but that passes half a foot into the beginning of the Artery, which space was empty, and there it gives that motion to the stagnating Blood which shakes the Artery and distends it: And this is *Malpigijs*'s remark, *Arteriae moventur per accidens, quatenus percusso interna fluido attolluntur & urgentur.*

The motion of the Blood in the Arteries is reckon'd three or four times as quick as in the Veins, which are four times as big as the Arteries.

The Artery, after its Dilatation by the Blood injected, is again contracted by its own annular Fibres; but the Artery contracts no farther than the Impulse of the Blood had distended it, which is only a restitution of the distended Fibres to their natural Tone, rather than an entire Contraction.

The Stroke or Dilatation of the Artery, and the Contraction are proportionable and equal; and the Interval betwixt the Strokes are regular and natural, and this is usually call'd the *Rythmus* of the Pulse, since the Artery contracts no farther than it was distended by the Blood injected; by observing the dilitation we may guess at the Celerity and Greatness of the Contraction.

If the Arteries were not conical Vessels, and if their Situations were strait, the Blood could not give so great a Stroke on the Artery; but because of their conical Figure, the Blood passes with difficulty towards the Veins, and the Blood is reverberated by the oblique Situation of the Artery; and that makes the Pulse

more evident in one part than in another ; and where the Artery lies on a Bone, the Pulse is made more sensible, as in the Temples.

The motion of the Blood is more swift in the beginning of the Artery, than in its Extremities, because of the resistance it meets with in the Arteries by the Blood contain'd in them ; and by their conical Figure yett the Motion, because of the fullness of the Artery, is soon transmitted from one end to the other.

The Blood is carry'd on thro' the Arteries and Veins by an uninterrupted Stream, because the Contraction of the Artery gives a new Impulse to the Stream, which lasts till a new Injection is made by the Heart ; and the same Quantity as is injected, passes at the same time out of the Extremities of the Artery.

As soon as the Contraction of the Artery is finish'd, a new Injection of Blood is made by the Heart ; so that when the Heart is in its Systole, the Arteries are dilated ; and when the Arteries are contracted, the Heart is dilated ; and betwixt these Dilatations and Contractions an Interval is necessary.

The Canals of the Arteries are cover'd with Membranes, and annular strong Fibres



bres of a muscular Nature ; and their Tubes are soft, and may be dilated by the Blood : the Heart of it self is like a Muscle, and contracts its Fibres by the Influx of Animal Spirits, as all other Muscles do ; and 'tis alter'd in its Diseases, as all other Muscles be.

The Auricles of the Heart are also two Muscles, which inject Blood into the Heart ; the motion of the Auricles continues after the motion of the Ventricles cease in dying Animals ; the motion of the left Ventricle ceases first, and the right Auricle moves last, in which all Life and Motion begins.

The Office of the Auricles are to receive the refluent Blood, whilst the Heart is in its Systole ; and when the Heart is in its Diastole, the Blood is injected into its Ventricles ; and when the Ventricles are in their Diastole, the Auricles are in their Systole, and *Vice versa* : This is *Harvey's* Remark on the Office of the Auricles, *Motores primi sanguinis sunt Auriculae, praefertim dextra, primum viveus & ultimum moviens.*

Since the Contraction of the right Auricle preceeds that of the Ventricle, no more Blood can be injected than that Auricle can contain ; and the quantity of the

Blood must be computed by the Capacity of the right Auricle, and not by the Capacity of the Ventricles of the Heart. *Harvey* asserts, that the left Ventricle will contain one Ounce and half, two Ounces, or three Ounces, but the Auricle cannot contain half as much. In a Cows Heart the Ventricles contain'd four or six Ounces, the Auricle about two Ounces at most, which is more than the Heart of Man can hold, and their Auricles.

I have found by divers Experiments, That one Pound and half of Blood at least may be allow'd to every twenty Pound of the Weight of the whole Body, which is twelve Pound to one Hundred and sixty Pound Weight, and no more can pass at one Pulsation than the right Ear can contain, which I compute at one Ounce of Blood in every Pulse; so that in the seventy Pulses, which will happen in one Minute in good Health, four Pound and six Ounces will pass in one Minute; and in three Minutes thirteen Pound two Ounces, and the Blood may be allow'd to circulate twenty times in an Hour at least; and the quantity of Blood in a Man of a Hundred and sixty Pound Weight is at least thirteen Pound.

This

This is Dr. *Harvy's* Computation, the Heart makes a Thousand Pulses in half an Hour, and sometimes two Thousand, three Thousand, or four Thousand; and if one Ounce passes at each Pulse in half an Hours time, eighty three Pound of Blood, and four Ounces will pass the Heart.

The first Vibration of the Pulse began in an Embryo, where it was excited by the External Heat of the Heart; and since that External Heat produc'd the first Pulse, and since also the External Heat in the Air accelerates the Pulse, I can probably assert, That the Blood rarify'd stimulates the right Ventricle of the Heart, and thereby alters the Circulation in all Animals: In Exanguious Animals the Heart beats very slow, as in Snails, but in the Sanguineous it beats more quick and lively, which proceeds from the different temper of Blood and Spirits, which variously move the Heart.

That the different qualities of the Blood do alter the Circulation, is evident by the different kinds of Diet and Medicines which alter the Pulse; and this is sufficiently prov'd by the Injection of different Liquors into the Veins.

The Blood is naturally of a Spumose Consistence, which is turn'd into Bubbles by a Spirituous Air, which makes the Blood more compressible, and gives it a springy Nature like the Air, *Liquida compressa quaquaversum nituntur*: And thereby the Membranes of the Arteries are more easily propell'd outwardly, and distended.

The Bullulæ of the Blood move more quick in the Arteries, whereby they become more separated, and look florid; but in the Veins they move more slowly, and appear of a blacker Colour by their Cohesion; so if the Orifice of a Vein be made small, the Blood comes forth very florid.

The Blood propell'd to the Brain supplies new Animal Spirits, and promotes their Motion to all the vital Organs by the Motion it gives to the whole Brain and its Membranes, by the Pulsation of the Arteries, and Compression of the Brain thereby. This is the spontaneous flux of the Animal Spirits into the muscular Fibres of the Heart, which produces the reciprocal Contractions; and the Spirits are also irritated to vary their Contractions by the Qualities of the Blood injected into the Auricles and Ventricles; and

and a distention always preceeds the contraction of the Cavity, and is the cause of it, the Muscular Fibres being distended endeavour to restore themselves to an easie Tone which is natural to them.

In a natural Constitution of Blood the Heat is moderate, and may be compared to the hottest Heat of the hottest Air in Summer. I cut the Jugular of a Dog and put the Ball of the Thermometer into the Stream of Blood, which raised the Spirits in it to the top of the Thermometer.

The Spirits in the Blood are rarified by Heat because they are of an elastick nature like Air; the same Heat rarifies the Animal Spirits contained in the Nerves which are of the same nature, and when the Spirits are rarified by Heat they inflate and agitate the muscular Fibres with greater force and celerity, and more frequently.

The natural Pulse is moderate as to Greatness, Strength, Celerity, Frequency, and 'tis also equal in all its Pulses, for the same quantity of Blood is injected by the same force, in the same time, and the Arteries are contracted in the same manner as they are dilated.

The circulation through the Veins is naturally promoted by the Impulse of the

Heart and Arteries, by the circular Fibres in the Veins, by the natural Tone in the habit of the Body, but most effectually by the compression on the *Vena Cava* and *Porta* by Inspiration, which dilates the Breast and presses the Belly, and thereby protrudes the Blood towards the right Ventricle of the Heart.

The natural Uses of the Circulation are,

1. To preserve the due Crasis and Fluidity of the Blood, and a due mixture of the viscid and ferous parts.

2. By a long circulation to prepare all the useful secretitious Humours, *viz.* the Animal Spirits, Semen, Choler, Salt Lympha, Milk and Milky Lymphs, for the use of the Animal Oeconomy.

3. To expel all the excrementitious Humours, as Urine, Sweat, and hot Fumes from the Blood.

*Harvey* makes two sorts of Causes for destroying of the Pulse, the one is a defect of the reflux of the Blood, the other is a stop of the efflux of the Blood, which produces a Suffocation by too much Blood.

1. The Affections and Diseases of the Heart, the Obstruction or Compression of the Artery or Veins alter the Pulse.

2. The

2. The *Cacochymia* in the Blood, if it be too acrid, falt, bitter or slimy, watry or *acerbe*, if the quantity be too great or deficient, if the consistence be too thick or thin, all these vary the Pulse.

3. The Animal Spirits are alter'd by external Causes and Diseases, and a Malignity acts on the Spirits, as pestilential Vapors do, which are said to seize on the Heart, and all these after the Pulse.

I tried the following Experiment to imitate the Pulse and Circulation.

I injected into the small Guts of a Cow, by Sir *Sam. Moreland's* Hand-Engine, a sufficient quantity of Water to fill them; and I laid the Guts round on the Grass in 3 or 4 rings; the one end of the Gut was fastned to the Engine which was set in a pail of Water, and about half a yard of the Guts fastned to the Engine remained empty, as the upper part of the great Artery does; the other end of the Gut I nailed to a Stool on one side or edge of the Gut.

I observed that the Circle which was next the Pump vibrated like the Pulse as oft as the Water was injected, and that the Water in the Guts moved forward upon every stroke of the Pump, and returned back a little after the force was spent.

And

And this regurgitation may be perceived in the Pulse of weak Persons, and in Obstructions of the Artery. I observed the Pulse lesser as well as the regurgitation in the second Circle of the Guts, and in the third and fourth no Pulse could be observed, as there appeared none in the Veins, which are Vessels continued to the Arteries.

I observed farther, That the Water was forced out of the Guts in a continual Stream, and every stroke of the Pump did accelerate and give a jirk to the Liquor, like the bleeding from an Artery cut.

The Gut was always full of Water, and when I laid a Brick upon one Circle the Pulse in the Gut felt hard.

The force of the Water injected protruded the Gut, and the annular Fibres by their natural restitution promoted the motion of the Water, and kept the stream from any interruption, tho' the Injection was made by intervals.

I made 47 strokes by the Hand-pump in one minute, in which time 14 Pints of Water passed the Guts; the Gut was one Inch Diameter, and many Yards long, as I remember 'twas the whole Ileon of a Cow.



## C H A P. III.

*Concerning the sensible Alteration of the Pulse, or the differences of the Pulse.*

**I**F we consider the quantity of Blood injected into the Artery by the Heart, and that also which is contained in it, before the Injection, the Pulse is called great, high, or a full Pulse ; and the contrary, a small, low or empty Pulse: The great Pulse we know by the great distention or protrusion of the Artery ; and the small, by the small distention of the Artery ; in great Pulses the Artery appears like a large tense Circle, and in small Pulses like a small and more flaccid Circle ; by often feeling of the Pulse of the most healthful in the middle Age, and in the Spring, we must get the Notion of a moderate Distention or *Diastole* of the Artery, and to that we must refer the preternatural, greater or smaller Pulses, when they exceed the natural, moderate or middle magnitude of a Pulse, or where that is deficient. By  
a long

a long Experience we may get the Faculty of discerning the natural magnitude of the different Constitutions, which no Words can explain; and 'tis difficult to observe the full distention of the Membranes of the Arteries, and the several degrees of its flaccidity.

To a great Pulse not only a great quantity of Blood is necessary, but also a strong temper of Spirits to contract the Heart with great force.

A great Pulse is also produced by a great rarification of the Blood and Spirits; and we may observe these several degrees of great Pulses, if the Spirits be much rarified the Pulse becomes a little greater than 'tis naturally; if the Blood be also much rarified the Pulse is much greater; and 'tis extremely great in Fevers, where the Blood and Spirits are much rarified, especially if there be also a great quantity of Blood.

A small Pulse may depend not only on a small quantity of Blood, but on cool or weak Spirits, or cool, viscid Blood, or obstructed Arteries, or *Dyspnoea*, or stoppage in the Lungs, which hinders the circulation.

We know a great Pulse thro' fulness, by the hardness of the Artery in the interval of its Pulsation.

We

We know a great Pulse thro' rarification by the vehement Vibration of the Pulse; and in a small Pulse from weakness, there is little force in the Pulse.

Greatness joyn'd with Vehemence is a sign of Strength, but with Heat 'tis a sign of great Rarification of Humours; a small Pulse with Languor, is a sign of weak Spirits; if joyn'd with Coldness, 'tis a sign of little Rarification of Blood; with Hardness, 'tis a sign of a Tense Artery by Pain or Obstruction; and the Tenseness makes the Distention less.

The Distention in the Veins is a sign of a full Artery in Plethoric Bodies.

To discern the greatness of the Pulse, we use only a superficial light Pressure by our Fingers on the Artery; and a great Pressure stops a small Pulse, and a weak one; by the different Pressure we know a great and a strong Pulse, by a superficial the first, and by a strong Pressure a strong Pulse.

They who have dense, hard, solid Flesh, and strong Limbs, they have strong, thick fibrose Muscles in their Hearts; and by this we may know the strength of the Heart; and on the contrary, they whose Habit of Body is flaccid and soft, and their Texture rare, and Corpulence little, they have

have a flaccid, extenuated and enervate Heart.

The farther the Artery is from the Heart, the less is the Pulse; its force being refracted by the conical Figure of the Artery, and by the Blood contain'd in them; and when the Pulse beats very languidly, we cannot discern the Pulse in the Fingers, Temples, or Wrists, as in Faintings, Hysterick Symptoms, Weakness, and they who are near Death.

I shall hereafter Note divers Degrees of Preternatural Magnitude and Celerity, and frequency of the Pulse, and as many Degrees of Smalness, Slowness and Rarity; and I suppose the most natural Magnitude, &c. to be when the Pulse runs betwixt seventy and seventy five Beats in a Minute, all the Degrees above are Excesses in Magnitude, Celerity, Frequency; and the Degrees under are Defects from the natural State.

*Note,* That all great Pulses depend on great Strength and great Heat; and in all the exceeding Pulses, we find both Causes must joyn to make a great Pulse.

The exceeding Pulses are oft joyn'd with Weakness, and then the Pulse is small, and quick, and frequent, the Blood is as hot as in the other exceeding Pulses; but the Spi-

Spirits are too languid, and weakly contract the Heart. This small and frequent Pulse is in *Hectics*.

If we consider the force with which the Heart injects the Blood, the Pulse is either Strong or Languid.

A vehement Pulse is both great and strong, and we know it by pressing it hard; and by the greatness of the Strokes, and the great Resistance it gives to the Fingers.

In a languid Pulse the Artery beats weakly, and it will not bear pressing hard.

A moderate Strength is observable in the most natural and healthful Pulses; and the greatest Strength of any Pulse is when the Artery beats about seventy or seventy five Pulses in a Minute, in perfect Health; but if the Pulse exceeds that Number, it is preternaturally stronger; if the Pulse be deficient to those Numbers, 'tis preternaturally weaker, and we know the degrees of excess and defect of Strength by the Numbers.

A vehement Contraction of the Heart makes a vehement Pulse, and 'tis caus'd by a great rarification of the Blood and Spirits in Fevers, Pains, Inflammations, Passions, Madness, or in Obstructions of  
the

the Arteries, which irritate the Heart by a regurgitation of the Blood towards it.

The common Causes of vehement Pulses are hot Air, hot Diet, Youth, hot Constitutions in thin Habits, vehement Motions of the Body or Mind, as Anger, hot Baths, Watching, Medicines of hot Tastes.

A moderate strong Pulse is from healthful Blood, and great quantity of Animal Spirits.

A moderate strong Pulse is joyn'd with moderate Celerity, Greatness and Frequency.

The Motion of the Blood being in a Circle, if the Heart and Arteries move more vehemently, they will produce a greater and more quick Circulation; and if the Circulation be more quick, it must also be more frequent, so that these Pulses depend on one another; and if the force by which the Circulation is made be remitted, the Blood will move more weakly, slowly, and rarely, and the Circulation will be carry'd on more rarely.

If the Spirits be weak, they make a small Pulse; but notwithstanding if there be much Heat, which stimulates the  
Heart,

Heart, the Pulse will also be quick and frequent, which will perform what is deficient for want of greatness.

A languid Pulse depends on languid Spirits, which must be observ'd by a gentle Application of the Fingers, without much Compression; and the languid Pulse is oft slow and rare, if it be without a Fever; or sometimes weak, small and frequent, as in extream weakness, as in the formicant Pulse, which oft succeeds the Vermicular.

If the Spirits be weak thro' defect of Spirits, the Pulse is equal; if thro' Oppression; 'tis weak and unequal.

The frequency of the Pulse is a sign of the greatest weakness of the Pulse; and if the Spirits be extream weak, and the Blood cool, yet the frequency will rather increase; but when the Faculty or Spirits are but a little weaken'd, the coolness of the Blood will make the Pulse rare.

The Pulse before a *Syncope* is very quick, then small, languid, slow, rare, intermitting, obscure, vermiculant, formicant: And these Pulses are signs of Imbecillity of Spirits, as an Impotency to voluntary Motion is also a sign of it.

An intermitting Pulse thro' the oppression of the Organs, is great and vehement;

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but

but an intermitting Pulse thro' debility of Spirits, is small and weak.

These are the several Causes of languid Spirits.

1. Great Evacuations produces Languor of Spirits, such are Hæmorrhagies, Diarrhæas, Diabetes, much sweating in hot Baths, Fasting, Venery, and these make the Pulse first vermicular, after formicant, intermitting, deficient.

2. The Spirits are dissipated thro' long Fevers and Pains, Convulsions Sadness, Fear, Studies, Labour, they are languid in malignant Fevers; they are tir'd when the Organs of Circulation are oppress'd by Schirrus, Abscesses, Inflammations, Asthma, Pthysis, which cause unequal Pulses.

3. The Spirits are languid in the cold Cacochymias, where few are generated, and few are extracted from a crude, poor, low, unfermented Diet.

4. The Spirits are languid when their Flux is hindred towards the Brain, Glands, or when they cannot flow into the Cardiac Nerves thro' Obstruction, or Compression of the Brains in Apoplexies, Palsies, Dropsies of the Head, Lethargies, or any Tumours which produce sleepy Diseases; the Cardiac Nerves are sometimes

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oppress'd, and the Auricle of the Heart by fat Tumours, in an Erupyema, Pus outwardly compresses the Heart, and Water in the Dropsy of the Breast.

5. Whatsoever hinders the Heart from its alternate Contraction and Restitution, or else hinders the Blood from flowing in and out freely, and diverts the Blood from flowing towards the Brain, produces an intermitting Pulse, or imbecillity of Spirits, or Syncope; if the Arteries be obstructed by a Stone there is great Pain, if by a Polypus, Weight, Pain, a defect of Blood, or Plethora, as well as the great Acrimony and Viscidity of Blood or Windiness, convulsious Passions, and compression on the Nerves by Tumours, produce an intermitting Pulse.

If the Heart injects the Blood quick in a small time into the Artery, it strikes the Fingers swiftly; and when the Injection is slow, the Artery dilates slowly, and stays longer on the Fingers.

A Pulse that is strong, has always a Celerity joyn'd with it, because the Blood by a strong force is injected in a short time; and it makes a quick Protrusion of the Vessels, the force being vehement, and the Spirits vigorous.

The Pulse is very quick in Fevers, where the Heart is irritated by much Heat, or else in Diarrhy's by the rarification of Spirits only.

The Celerity is joyn'd with a weak Pulse in the formicant Pulse, so after great Evacuations, there is little Blood in the Artery; and the distention is made less, but quick, and it recedes as quick.

The Celerity of the Pulse is moderate in Health, and it is joyn'd with a moderate Magnitude and Frequency; and the degrees of Celerity may be stated by the numbers of Excesses and Defects as great Pulses are, with which they are joyn'd.

Weak Spirits, thickness, coldness, sizziness of Blood, and Obstructions of the Nerves and Arteries, make the Pulse slow.

A little Celerity we cannot discern from the Natural, but that in Fevers is known by the quick Stroke, and its sudden recess from our Fingers, the quickness of the Motion in the Artery shews how swiftly the Heart injects the Blood.

*Note,* That by the quickness I understand the Celerity of the Distention of the Artery by the stream of Blood; but we cannot feel the swiftness of the Stream  
be-

because of the Membranes betwixt that and the Fingers; but the Celerity of the Distention shews the swiftness of the Stream; not only the Heat and Rarification of the Blood and Spirits contribute to the Celerity, but also the Fluxility, or thin consistence of the Blood, and the freedom of the Arteries from Obstruction, Compression and Constrictions.

In the discerning the Celerity of the Pulse, we must rather observe the *Impetus* of the Motion, than the time of Dilatation, or the Space it moves thro'.

A quick Pulse is familiar to great strength of Spirits, or great Heat; and 'tis a sign of one of them, to a Celerity, a moderate Strength is necessary for the most part; and Fevers are best known by the Celerity of the Pulse: The Blood moves very swiftly in ordinary Fevers, in Health there is about seventy five Pulses in a Minute, and in Fevers 100; so that if the Blood circulates ordinarily in 3 Minutes, in Fevers it circulates in 2 Minutes.

When the Artery feels hard or soft, that makes another difference in the Pulse; it feels hard when 'tis obstructed in some of its Branches, for then it stops in some of its Branches, and fills it; and this happens in Pleurisies, and other

Inflammations by sify Blood, or when the Membranes and Arteries are constringed and contracted by Pain, this hardness from Pains I may, for distinction, call it a Convulsive hardness; and this may be observed in the Melancholics, Hysterics, and nervous Pains. In Quartans and a Schirrus hard Pulses are observed from viscid Humours obstructing the Artery and *Viscera*; but besides the Inflammatory and Convulsive hardness, there is a Plethoric hardness from fulness of Blood.

In Fevers the Pulse feels sometimes hard and great, from inflammatory Tumors. *Galen* denies that there is any full Pulse, but he refers that to the hard and great.

A hard Pulse is not only from Inflammations, Obstructions, Tension of the Artery by repletion, from the Schirrus of the Liver, Spleen, Womb, Stomach, but drinking cold Water when hot, and from consumptive, dry Arteries, much Wine, cold Air, catching Cold when hot, all which produce sify Blood to obstruct the Arteries.

*Galen* mentions a Fever with great Pains in a Tendon of the Fingers by a Bruise, and the Pulse was made hard by the Pain in the Tendon; he there observes that

that Water-drinking and eating cold Fruits in Fevers, makes the Pulse hard, which must be effected by coagulating of the Blood or Chyle.

The soft Pulse is from an emptiness in the Artery thro' a defect of Blood, or by the obstruction of its motion in the Lungs; such happens in *Peripneumonia's*, and other Diseases of the Lungs : And a soft Pulse is observed in Lethargies, Sopors, Mania's and Palsies, because the circulation is stopt in the Head, and a soft Pulse is observed in Quotidians, where the Blood is not sufficiently rarified. The Pulse is properly called *Pulsus inanis*; and there is generally a soft Pulse in fat Bodies which are Phlegmatic, and in Women who are cooler than Men, and in old Age; in all these the Mass of Blood is deficient, or not sufficiently rarified to fill the Vessels, or else the reflux of Blood is hinder'd to the Heart by its stagnation in the Head, or in the Lungs, or habit of the Body in fat Persons and *Anasarca's*. In dry Bodies the Pulse is more hard, in humid or soft fat Habits the Pulse is soft, the nervous Parts are most tense, and that makes the Pulse most hard when swelled or inflamed, especially if the Inflammation be near the Heart, or if the Diaphragm be inflamed;

but the carnous Parts being inflamed, the Pulse is not so hard, nor if the Stomach be inflamed.

The next difference of the Pulse is from the Intervals betwixt the Pulsations.

A frequent Pulse is when the time of the Intervals is short, and a rare Pulse is when the time of the rest betwixt the Pulsations is longer. This makes a distant Pulse, and this Rarity happens when the Blood is less rarified, or the Spirits weak; 'tis Heat which makes the Pulse more frequent, for the frequency of the Pulse depends on the frequent irritation of the Heart and Spirits by hot rarified Blood; and a rare Pulse wants that irritation, according to *Galen's* Observation, *Τὸ δεινὸν ταχύνιστον τὸ ψυχρὸν βραδύνιστον*. The crebriety of the Pulse is familiar to weak Spirits, and then 'tis weak and frequent; or great Heat, and then 'tis great and frequent.

The most useful distinction of Pulses, and the most certain, is the difference we observe of the numbers of the Pulse in a minute; the most natural Pulse will have from 70 to 75 in a minute in perfect Health; if the Pulse run above those numbers the Body is over-heated, and the Blood and Spirits too much rarified, and the

the Pulses are greater, quicker and more frequent, from 75 to 120 Pulses in a minute; and all these numbers are the exceeding Pulses, because they exceed the natural numbers in a healthful Pulse; and this happens in hot Constitutions, and hot Diseases, and the contrary, which fails in the natural number of Pulses, I will call a deficient Pulse, which happens in cold Tempers and cold Diseases; these Pulses are also deficient in magnitude, force, celerity, and frequency, and they are weaker, softer, more slow and rare. I have observed them from 70 to 55.

I will here affix the following Table of Pulses, distinguishable by their Numbers, whereby we may know the severel degrees of Greatness, Strength, Celerity, and Frequency of Pulses.

I will first describe the exceeding Pulses, and their Degrees.

*Pulses from 75 to 80.*

At this Number the Blood and Spirits are a little hotter than ordinary, and for distinction sake I will call it Hot in the first Degree, and in these the Pulse is a little greater, quicker, and frequenter than 'tis naturally.

*Pulses*

*Pulses from 80 to 85.*

I make this Number a hot Pulse in the second Degree; this exceeds the other in quickness, greatness, and more frequent than the former, which depend upon a different rarification in the Blood and Spirits.

*Pulses from 85 to 90.*

I make the third Degree of hot Pulses at the Number I have found the Pulses of some extream hot Persons in a morning, therefore here I must place the extream hot Constitutions, and all Numbers above this belong to extream hot Diseases.

*Pulses from 90 to 95.*

This Number I have observed in Diary Fevers, Pains, Inflammations, Ebullitions of Blood in all Defluxions; this Pulse is feverish, very great, quick and frequent.

*Pulses from 95 to 100.*

This Number shews an Intermitting Fever, or a Hectic out of the Paroxism;  
this



this Pulse is feverish, more quick and great, and frequenter than the former.

*Pulses from 100 to 120.*

This Number is in the Fits of Hectics and Intermitting Fevers, and the Pulse is extreamly quick and frequent, and hot. The formicant Pulse happens in malignant Fevers, 'tis weak and very frequent, scarce to be counted; this may be placed about 120.

*Note,* That we cannot well count above 140 Beats in a minute; but how many Pulses may happen in a minute 'tis not easy to determine, nor how few; but I have mentioned no more than I have observed.

*Note,* That if the Pulse be exceeding hot and strong, all the difference above-mentioned will happen; but if the Spirits be weak, and Blood hot, the Pulse will be small, quick, and very frequent.

If the Spirits be strong and Blood cool, the Pulse will be moderately great, but slow and rare.

If the Spirits be weak and Blood cool, the Pulse will be languid and rare, slow and small.

If the Strength be great, and beat great, the Pulse will be very great, quick and frequent.

These are the four Compositions which happen by mixture of the Strength of the Animal Spirits, or their weakness with the hot and cold Tempers of the Blood.

If the alteration of the Blood and Spirits be moderate, the alteration of the Pulse must be moderate; and if they exceed in quality, the Pulse will alter as much.

A small Pulse is usually joined with a slow and rare in cold Tempers and Diseases. The Pulse exceeds the natural healthful Pulse from 75 to 90, which I divide into three Degrees, and from 70 the Pulse is deficient to 55, which I also divide into three degrees. The most moderate and temperate Pulse is betwixt 70 and 75 in healthful People, in the Spring, at middle Age, and their Pulses are moderately great, strong, quick, and moderately frequent, as in sanguine Tempers, fat and plump.

The following Table contains the defects of the Pulses from their natural Number, and these are distinguishable by the smaller Numbers of their Pulsations in a minute.

This

*Pulses from 70 to 65.*

This is the cold Pulse in the first Degree, and 'tis a more rare, small and slow Pulse than the natural, but 'tis but a little altered from the natural; external Cold and Fasting will sink the Pulse to this Number; this happens in pituitous, fat Bodies, a little sanguine.

*Pulses from 65 to 60.*

This is the second Degree of cold deficient Pulses, and the Pulse is more rare, small and slow, than the former; this happens to the fat, pale, cool Tempers about Sixty, as in ferrous Tempers.

*Pulses from 60 to 55.*

In this Constitution appears the extreme chilness in the third Degree, in the most cachectical, and the Blood and Spirits are least rarified.

The vermicular Pulse is slow and rare in the Cholera, great Diarrhæa's, *Fluxus Mensium*, and all Evacuations which dissolve the Spirits, therefore this Pulse must be placed at the last Number of  
slow

slow and rare Pulses, I suppose that about fifty.

In a Syncope the Pulse is small, languid, unequal, and at last ceases with all Sense and Motion, I suppose that at forty.

I cannot determine the Numbers of these very low Pulses, for want of sufficient Experiments; the Pulse does not run frequently below sixty, because of our hot Diet and temperate Air; I have rarely met with any Pulses below sixty Beats in a Minute in Health. How far Diseases will sink I do not know.

By the Actions of any particular Part, and by their Secretions we know the temper of particular Parts, as the Stomach, Brain, Kidneys; but by the Pulse we know the temper of the whole Body, because that shews how the Blood is digested, and the Secretions perform'd, the greatness and frequency shew the degrees of Heat in the Blood; and the strength of the Pulse shews the strength of the Animal Spirits, on both which the Circulation and Secretions depend; the Animal Spirits, like other secretitious useful Humours, return into the Blood again, and they will produce a great and a strong Pulse, by rarifying of the Blood, as well as by their Influx into the Muscles of the Heart.

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Animals differ in Constitution from one another by the different rarifications of their Bloods and Spirits, and by a different proportion of their Viscera; in some the Brain or Liver, or Spleen, or other Glands abound, and exceed in their Secretions more than in others; and the Choler gives Courage, but the Melancholy Fear.

We call all those Pulses unequal, when they are alter'd into different Strength, Greatness, Celerity, or Frequency, or Numbers unequal in the same time.

If the Blood be propell'd by the same Vigour and Strength by the Heart, and if the same Impulses be given to it in the same distance of time, the stream of Blood passes in the same time thro' the Arteries, and then we reckon the Pulse equal.

A singular inequality is in one Pulse, and a systematical inequality in many Pulses compar'd together.

The Causes of the inequality of Pulses, or of any Irregularity in their Motions, are

1. From the weakness of Spirits, or the oppression of them, or their irregular convulsive motion in Palpitations, Tremors, Hypochondriac Syncopes.

2. By

2. By the compression, constriction, or obstruction of the circulating Organs, the Heart is affected by Inflammations, Wounds, Ulcers, Tumours, Polypus, Worms in the Pericardium, or Pus, or too much Fat; the Blood is stopt in the Lungs by Tubercles, Inflammations, Schirrus, Ulcers, Imposthumes, Asthmatick Fits, and Hysterics, Polypus; the *Aorta* is obstructed by a Callus; the Arteries are oppress'd by Schirrous, Tumors in the Viscera, much Fat, and Flesh, the Varices stop the Veins, and the Capsula oft grows to the Heart, or Diaphragm and Lungs are joyn'd.

3. The Blood is in a great quantity, or coagulate, or viscid, which stops the Circulation, and so does a defect in the due quantity of Blood.

4. The Pulse is unequal by consent of other Parts, as Head, Lungs, Spleen, Stomach.

These are the collective Inequalities.

1. The *Pulsus de curtatus*, when one Pulse is lesser than another; and when they return to the same Magnitude again, they are call'd *reciproci Decurtati*.

These Pulses are unequal in Magnitude.

2. The

2. The Pulses are unequal in Vehemence, when some Pulses are stronger, and others weaker.

3. An intercurrent Pulse is unequal in Crébrity, when one Pulse happens more than usual.

4. An intermitting Pulse, when one or more Pulsations are wanting to the usual Number; and if after the ceasing of the Pulse, it beats again, 'tis call'd a *Deficiens Reciprocus*.

5. The *Myurus*, is when one Pulse is gradually less than the other till it stops, and 'tis sometimes recurrent; this is an inequality in Magnitude.

6. The exceeding and deficient Pulses mix'd, are reducible to the unequal Pulses.

7. In the oppress'd Pulse there is an inequality in the Celerity and Greatness; if the Oppression be little, the Pulses will be great and small, with strong and weak Pulses mix'd.

These are the Inequalities in one Pulsation, or Irregularities in it.

1. Some inequality happens in the Arteries of one Arm from that in the other, by the different Situation of it; and one Artery is more quick, vehement, or slow and weak than the other.

If an Artery be cut, the Pulse is lessened in that Part; and upon decay of any Part, the Blood moves faster in the next; and the Blood being stopt in the lower Arteries, it moves more violently in the Carotides, as appears in the Green-Sickness by the Pulsation in the Neck.

2. The *Pulsus Dicrotus*, is when the Pulse seems to strike twice thro' some double irritation of the Heart, or obstruction in the Vessels.

3. A vibrating Pulse is compar'd to the motion of a Dart, and 'tis caus'd by a vehement Contraction of the Heart, which makes the Pulse greater.

4. The *Pulsus Caprisans*, is when in one Diastole there is a double Stroke; and the latter moves more vehement and quick than the former; this motion seems to be divided into two Parts, with an interpolated rest; in this the motion of the Heart is hinder'd by fulness of Blood, or obstruction of the Artery.

5. The deficient Pulse is when the Motion seems to stop, and is an imperfect contraction of the Heart; this is an inequality in smalness of Pulsation.

6. A vermicular Pulse is when the Artery moves slowly, and is but a little distended; and it represents the motion of  
a Worm,



a Worm, who goes forward by twisting and slow bending of it self, or lifting up; this is a very slow and small Pulse.

7. A formicant Pulse is like the motion of an Ant, who moves her Feet oft without going much forward; this Pulse is the extrem weak, small, and frequent.

8. The undose Pulse is when the Artery is mov'd by Parts, like Waves, if the undose Pulse be weak, it ends in the vermicular; this undose is slow and rare from weak Spirits, or their oppression by fullness of Humours; the undose is distinguish'd from the vermicular by its greatness; and as that diminishes, it ends in the vermicular, and this ends in the formicant, and thro' smalness and weakness it becomes very frequent.

9. The convulsive Pulse is drawn like a Cord, and 'tis small; but the vibrating Pulse is distinguish'd from it, because 'tis greater.

10. The trembling Pulse is in Palpitations, and thro' weak Spirits, and is Melancholy when the Heart trembles and palpitates.

11. In all Distempers of the Lungs the Pulse is apt to intermit, because the Blood is stopt there; and the Pulse is soft, because little is injected into the Artery.

12. The excretory Pulse is the strong undose as in sweating, and all Evacuations at first.

13. The Pulse is obscure where we cannot count its Strokes, or well discern its Pulsations, as in very young Children, and very fat Persons.

*Note,* That all the Inequalities mention'd, are either ordinate or inordinate, observing no Order.

All the Inequalities in one Pulsation are properly irregular and unnatural Motions; and I have added many to the old Inequality.

Tho' the Blood runs faster in the beginning of the Artery, than in its Extremity, yet there cannot be observ'd what *Galen* mentions, different Motions in different Parts of the same Artery.

## C H A P. IV.

*Containing the Causes of the alteration of the Pulse by the Temperament, Sex, Age, times of the Year, and Habit of the Body.*

**T**HE continent causes of the Pulse are the strength of the Spirits, and the irritation of the Blood, and as internal Causes alter the Blood and Spirits, so they alter the Pulse.

1. The old Authors distinguished the several Constitutions by the several Qualities which occurred to our touch, *viz.* by the Qualities of hot, cold, dry and moist. The hot and cold ought to be appropriated to the temperament of the fluid parts, but the dryness, and humidity or softness, shew the Temper of the solid parts; by the dryness we describe the gracility or hardness; and by the humidity the plumpness or obesity of the habit of the Body.

Children and young Plants have moist Constitutions, or most nutritious Humors

contained in their solid parts, which makes them plump, fleshy and full of mucous Nutriment; but old Men and dry Plants feel hard for want of Nutriment. As to Animal Humours they are best described by the particular Circulation which digests them, and prepares them for their Secretions; but chiefly by the taste of the secreted Humours which return by a particular circulation into the Blood, and impregnate it with a particular Taste and Tincture.

1. Choler is of a sweet, bitter, acrid Taste, and it returns into the Blood again with the Chyle, by the Lacteals. *Borellus* believes that it returns by the *vena porta*. He has prov'd that the Secretion of Choler is made by the Glands of the Liver from the Blood, as it were through the pores of a Sieve: From whence I infer, That Choler pre-existed in the Blood. And he farther demonstrates, That one ounce of Choler is at least secreted in an hour; and that 32 pound of Choler is secreted in a day through the Liver, and that there is in 20 pound of Blood 2 pound of Choler. By this Experiment 'tis evidently proved, that Choler does always remain mixed with the Blood. It is produced by a frequent circulation, and its  
bitter

bitter acrid Taste stimulates the Heart to a frequent contraction. This Choler is necessary to the crasis of the Blood, and the Digestion of the Meat, therefore by this Humour *Hippocrates* wisely distinguished the several hot Constitutions, for this gives an Acrimony to the Blood, and that stimulates a frequent circulation.

The Blood it self is of a sweet Taste; and this obscures the Taste of the Choler mixed with it. The great Mass of Blood is from the sweet Chyle, and has the same parts, *viz.* the serous, oily and viscid, but in a higher Digestion, and from the Chyle the Blood has its sweetness. By the sweet Taste I will distinguish the sanguine Constitution, and that Taste will not irritate the Heart too much; in the sanguine Temper the Blood and Spirits are well rarified, and they make the Pulse great, moderately slow and full; and all the motions of the Body are moderate as well as those of the Mind in the sanguine Tempers; the Pulse runs betwixt 70 and 75, the Face is florid, the Body plump, and Heat moderate, their Pulses great, slow and full.

2. The cold Constitution depend on the Phlegmatic Humors, and their Pulses are more slow and rare, and soft.

The natural *pituuta* is the Chyle new mixed with the Blood, or the Lacteal Lympha's secreted from it by the conglomerate Glands, and this is returned into the Blood again with the Chyle through the Lacteals, therefore the Blood is always tinctured by it; and the pituitous Constitutions depend on the great quantity or crudity of this Humour; and it gives either a mucilaginous sweetness or slimy Acid, or watery crude taste to the Blood, by the Phlegmatic Lympha, which appears to be of various tastes when 'tis secreted from the Blood.

3 The Melancholic Humour is the third secreted Humour which *Galen* describes as acid, like sharp Vinegar; I shall make two Species of this Humour, acid Acrid, and the *Acerbe* or acid Styptic. The Pulse of the hot Melancholic is quick and frequent, and hot; the Pulse of the cold Melancholic is slow and rare. The Melancholic Humour is bred in the Spleen, and is thick, black, stagnating Blood, tinctured with an Acid, and is thence returned into the Blood again; some melancholic black Humors are secreted into the Stomach, Mouth and Lungs in black Spittle, and thro' the Glands of the Eyes in blackness thereabouts, the Vitriolic Acidity

dity may be evidently tasted in healthful Blood, and it has a private Secretion with the lacteal Lymphas, and it returns into the Blood again with it; the hot Melancholics oft vomit Bitter and Acid, and the Cold a rough Acid.

The choleric Tempers may be betwixt these Numbers 75 and 80, the Salt betwixt 80 and 85, the Phlegmatic betwixt 70 and 65, the cold Melancholy betwixt 65 and 60.

4. The Salt Lympha is the fourth secreted Humour, whose Office is to change the bitterness of Choler to a sweetness; to dilute the Chyle, and change it into Blood; and this Lympha is either Acid and Salt in the hot Scorbutic, or watry and crude, slimy in the Phlegmatic and Cachectick; this returns by the Lymphatics into the Blood again.

From these several secreted Humours remix'd with the Chyle, Blood, and Animal Spirits, and other Secretions, the fluid Parts of Animals, as well as the solid, have their several Temperaments: The Mass of Blood is chiefly Chyle, chang'd and mix'd with these secreted Humours.

The particular Natural, as well as acitious temperament of our Humours, depends on the prevailing Quantity or  
Qua-

Quality of these Humours, which are re-mix'd by a private Circulation with the Blood.

The general Circulation produces the several particular Circulations abovemention'd; and these particular Secretions supply both quantity of Humours and irritating Qualities to help and alter the general Circulation.

*Galen* deduces all the *Cacochymias* from these secreted Humours, Ὅταν ἤδη ζανθῆς χολῆς, ἢ μελαίνης, ἢ φλέγματός, ἢ τῆς ὀρρωδῶν υγρῶν μεσὸν γίνεται τὸ σῶμα, κακοχυμίαν ἢ πληθῶραν καλεῖσι ἢ τοσαύτῃ διάθεσιν.

*Hippocrates* wisely and justly divided the Temperaments into the Choleric and Phlegmatick; the first is known by the exceeding Pulses, and the last by the Deficient; the hot Constitutions have a hot, great, quick, and frequent Pulse: Interval Heat makes the Pulse greater, quicker, and more frequent, but not much stronger, or vehement; but if the Spirits be weak, the Pulse is neither strong nor great, tho' the Heat be Intense; besides, the general Pulse in hot Constitutions, there is some particular Note in the Pulses of hot Tem-pers, to distinguish the several Degrees, but by the Numbers of the Pulse they will be most evidently distinguish'd.

I shall



I shall make four original Constitutions, the Choleric and Salt are the Hot, the Phlegmatic and cold Melancholics, are the cold simple Tempers. But these may be mix'd with a lean and plump Habit, and make four compounded Constitutions.

The quantity and mixture of the simple secreted Humours, or their Qualities, acquir'd by being over digested, or crude, produce all the Cacochymias.

*The Number of the Pulses, in hot Cacochymias  
from 75 to 80.*

This is the first degree of hot exceeding Pulses, and I will call it the hot Choleric, or Sanguine; the Blood and Spirits are more rarify'd than in the true sanguine temperate Constitutions (which stands betwixt 70 and 75 Pulses in a Minute) their Choler is vitelline, like the Yolk of an Egg; the Serum is a little more salt by the Evaporation of its thin parts, and the melancholic Acid is little alter'd; in this Constitution the bitter Acrid of the Choler prevails, and we may call this the bitter, acrid or choleric Constitution, either natural or ascititious by these Causes, hot Seasons, hot Air, much Exercise, hot Passions, Cares, Study, Watching, hot Medicines,

dicines, Excrements retain'd, hot Baths, hot Diet, these produce a quick, frequent great and strong Pulse, which produce much Choler, and that very bitter and acrid; the particular Note of the choleric Pulse is, that 'tis vehement and vibrating; and that the Acrimony of the Choler irritates the Heart to beat above 75 Pulses in a Minute; the Blood of such Persons is thick and florid, and their Urine and Face yellowish, and high florid Colour in the Cheeks, their Bodies are plump, feel hot.

*Pulses from 80 to 85.*

The salt Temper of the Blood is known by this Number, a great Heat evaporates the thin Serum, and the rest becomes more Salt; and this may be call'd the Salso Acid Constitution, and this happens in the Scurvy, the Gums are putrid, Ulcers in the Leg, the Spleen swells, the Blood and Spirits are infected with the Cacoehymias, and produce a very quick Circulation; the viscid Choler becomes more eruginous by the mixture of a soft acid Serum, the Urine is Lixivial, and the general Taste of the Humours are Bitter and Salt, as is the Taste of a Lixivium, the

the salt Pituita was describ'd as a Humour bred from Aduſt and bitter Humours, and mix'd with the Serum of the Blood, as *Aricen* affirms, the Pulse is greater than in the Choleric, and more frequent and unequal.

*Pulses from 85 to 90.*

At this Number I place the Atrabilis, which Humour depends on a mixture of a vitriolic Acid, (which may be taſted in the moſt healthful Blood) with very acrid Choler; this mixture makes the Spirits furious, and windy, and corroſive, and they move the Muſcles of the Heart furiously in *mania's*, which is produc'd when the acrid Choler prevails above the Acid; but if the Acid prevails, they are melancholy and fearful: This Choler is of a black Colour, Acid, acrid as Vinegar; the Pulse is unequal, becauſe the Spirits are irregularly mov'd; but at laſt the hot Spirits evaporate, and then the Pulse becomes ſlow and rare, and the Blood appears black and very thick; the Habit of the Body is thin, hairy, and Face Lead-colour'd, and Aſpect horrid; when the Blood is only black and thick thro' Heat and violent Circulation, 'tis only the beginning

ginning of the Atrabilis, which is from a dust Blood; but when acrid Choler, and the vitriolic Acid are much mix'd with a dust Blood, 'tis properly call'd Atrabilis; hence the Cancer, Piles, Varices, Leprosy are bred; and if a Fever be in this Constitution, it produces Quartans, Carbuncles, Gangrene, black Boyles.

I divide the melancholy Humour into two Species, the Atrabilis as above describ'd; and into the tartar Acid mix'd with Phlegm, which is the cold Melancholy; the best Description of Melancholy is given by *Hippocrates*, in his Book of Diseases, he describ'd the black Disease thus; they vomit black as the Dregs of Wine, after like Blood, sometimes like the secondary Wine, sometimes like the Juice of the Polypus, sometimes like Vinegar very Acid, sometimes they vomit a Saliva, or thin Pituita, sometimes green Choler; there are Pains in their Sides, and a slight Fever, Pain in their Heads, their Legs have a weight or lassitude, their Colour is black; these Symptoms are signs of great Heat, and I observe that *Hippocrates* calls it, πυρητός ἑλινχεός; and since I find all Vapour Fits to have the Pulse of a diary Fever, I place this Constitution next to the Fevers as the hottest Temper

or

or Constitution ; and *Galen* always affirms, that the melancholick Humours are bred from the aduſtion of Humours, *γίνονται μελανχολικαὶ κροσῆς ἐκ σύνκραύσεως αἱμάτων*, tho' this be plac'd among the exceeding as a *Cacochymia*, yet the natural melancholic Humours muſt ſtand among the deficient Pulſes, as the old Writers place it.

As all the Pulſes above 75 are the hot Pulſes, ſo all below 70 are the cold Pulſes, and we may call them the Natural, or Preternatural cold Conſtitutions, or *Cacochymias* ; the Pulſe of theſe pituitous Tempers in general is ſmall, ſlow, ſoft, and rare ; the Cauſes of theſe cold *Cacochymias* are cold Air, Idleneſs, Sadneſs, Fear, long Sleep, cool Meats, Water-Drinking, &c. Women and Phlegmatic fat Bodies have the Pulſes mention'd.

*Pulſes from 70 to 65.*

Here I place the firſt degree of the pituitous Tempers, and they may be call'd the ſweet Phlegmatic or cool Sanguine, when this Phlegm abounds the Blood and Spirits are a little cool, and the Pulſe becomes more rare, the Skin is ſmooth and ſoft, the Body plump, the Cholera in theſe

is more sweet than bitter, and little acrid, the Serum is more crude, and watry and slimy, the Chyle is more mucilaginous and watry; and then naturally Women and fat Bodies are of this Temper, their Complexion is White and Pale, without Thirst or much Appetite; this is also the mucilaginous, slimy or pituitous Cacochymia, and the Pulse is more slow, rare, soft than the Sanguine.

*Pulses from 65 to 60.*

At this Number I will place the ferous Constitution, the Spirits are cool and the Blood watry, their Phlegm is insipid, the Extremities cold, and Urine pale; they are stupid in their Minds, and slow in their Motions; their Digestions are weak, and that breeds crude, insipid watry Humours, and the Pulse is slow and rare, and very soft, which is the Pulse peculiar to hydroptic Tumours, Cachexies; their Face is Pale, the Blood let out has much Serum, the Legs, and Belly and Face are apt to swell, they have many Obstructions, spit much, and sometimes have some Evacu- ations of Serum stopt, the Habit of their Bodies is soft and flaccid, and swell'd.

*Pulses*

*Pulses from 60 to 55.*

At this Number I place the acid Phlegmatic or cold melancholy Tempers, there is much cold Wind in their Stomachs, and their Cholera is porraceous and green, which is from a mixture of Acid with it, and that Colour in Cholera is a sign of a weak Digestion; and a green Humour is oft vomited up in this State, the Acid prevails, the Pulse and Motions of the Body and Mind are slow, there is much Spit, little Thirst, the Water is Pale, the Body is Bound, the Skin is Cold and Dry, they find Benefit by hot Diet, and are offend- ed by Acids and Cold; this Distemper is worst in *Autumn*, betwixt forty and sixty, the Pulse is slow and rare, and hard, be- cause of the thickness of the Blood; and in this Constitution the Acerbity of Hu- mours is most evident, and this Cacochy- mia is windy and sour: At this Number we must reckon the Old, whose solid Parts are dry, and unfit for nutrition; and in respect of their Fluids they are cold, the Blood and Spirits being but a little rari- fy'd, they are subject to a Stagnation of Blood, and their Spirits are weakly mo- ved in Stupors, Tremors, the Stagnation

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of the Blood breeds Apoplexies and Palsies, if the Blood be thick, fizy, and thence the Face appears Blewish or Pale, their Extremities cold, thro' want of a quick Circulation, the watry Serum separates from the viscid Cake of Blood which breeds Catarrhs, Loosness, Hoarseness, Coughs, Flux of Urine; their Digestions, and Sanguification and Secretions fail for want of a due Circulation; in these we observe a vitreous heavy Phlegm, which produces Cholic Pains, obstruction in the Trachæa, and other Viscera, in all decrepit and old Men of cold Constitutions, such is that Constitution the old Writers call'd cold and dry.

By these several Constitutions I understand no more than a tincture of the Blood by a mixture with the secretitious Humours; and this continually alters with external Causes by Passions, hot and cold Diet, but that is to be esteem'd a particular Constitution where the Pulse runs more oft to one of the Numbers than to the rest; but the Constitution of Humours alters with the Age, and different Seasons of the Year; therefore we must chiefly consider the Morning Pulses to find out any particular Temperament in our Humours; and these Numbers which oft hap-



happen in the most temperate Time of the Year, and the best Health; and that Number which stands in the middle of the Latitude of our healthful Pulse, must be esteem'd the most natural Constitution of every Person. The Phlegm is oft digested into Blood, the Choler into Salt, or Atrabilis, but they never can return to Blood again; 'tis certain, that Choler is of less Digestion, and is produc'd by a less degree of Heat than Saltness, which seems to have its rise from the Acrid in Choler. Atrabilis is of a higher Pulse, greater Heat, more fermenting and windy than the salt Constitution, and the fury of their Spirits is equal to these in a diairy Fever; the sweet Phlegm is next to sweet Blood in Digestion, the crude slimy Serum seems next in Digestion to sweet Phlegm, the acid and vitrious Phlegm seems to be the most indigested of any Lympha, and the coldest in Quality; so in the Crude Juices of Plants, which are prepar'd the same way; the *Acerbe* is the crudest, the watry, slimy Subacid is the next and moderate degree of Crudity; and the slimy Sweet is the last degree of Crudity, next to the great sweetness of mature Fruits, all these several degrees of Crudity appears in Grapes; if we consider the Qualities

of Medicines, the sweet Tastes are most Temperate, the slimy Sweets are inclining to cooling in the first degree; the watry, slimy are more cooling, and the *Acerbe*, or acid, slimy and watry most cooling; so if we consider the hot Tastes, the bitter is least hot; the Salt or Pungent more hot, the sharp Acid and Acrid being both very Volatile are Corrosive, as Spirits of Niter, and this is like the *Atrabilis*. This is the Ground or Reason of my placing the several Humours in the Order I have done; so *Galen* calls yellow Choler the *ζεφυρότατον*, the Phlegm the *ψυχρότατον*: The Blood he makes a hot Humour next to Choler, and the melancholic Humour the coldest, next to Phlegm; and we find in the old Authors divers Species of Choler, when preternatural; the *Bilis vitellina*, *ceruginosa*, and *atra orglastea*; these are bred in the Blood, but the *Porracea* in the Stomach by mixture of an Acid; and the old Writers made divers degrees of Phlegm, the sweet, which has best Digestion; the insipid, which is of moderate Digestion; and the Acid, which they thought coldest of all. According to these several degrees of Choler and Phlegm, I have noted such degrees of Numbers as I found most frequent

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in several Constitutions; but this adjusting the Numbers of the Pulse to the several Qualities of our Humours, perhaps is no less difficult than useful. I have given my Conjecture and Experience.

In those Persons who have the best Tempers, the Blood and Spirits have a moderate Rarification, and their Pulses are moderate as to Strength, Greatness, Celerity, and Frequency and Fulness; and there's no Inclination to the hot or cold Cacochymias, which I have above describ'd.

Cold first alters the frequency of the Pulse, then the Velocity, and at last the Greatness; the Heart is less stimulated by cold Blood, and therefore makes a small Contraction, and a less Pulse; such sort of Blood runs slow, and consequently returns not oft to urge the Heart; the Spirits are weak in cold Tempers, which makes the Pulse slow and weak; the want of rarification makes the Pulse soft, the weakness of Spirits alters the greatness and celerity of the Pulse chiefly, and not the frequency; and the Pulse becomes very frequent when the Spirits are extream weak, tho' the Blood be very cold.

2. I will next consider the alteration of the Pulses, according to the difference of Sexes; the Pulses of Men are stronger and greater than those of Women, because their Spirits are stronger and hotter; the Reason of which is, because the seminal Lympha returns into the Blood of Men; and the Virtue of the Semen invigorates both the Body and Mind of Men, by which they become stronger, hotter, and more couragious than Women; the smell and taste of the Semen appears in the Flesh of Males, when they generate; and by castration they lose all their fierceness and hot Tempers.

The coldness of the Blood in Females would make the Pulse rare and slow more than in Men, if the Passions of the Female Sex did not make their Pulses more frequent and quick.

Women given to a laborious Life of hot Tempers in hot Seasons, are of greater Pulses than Men in contrary Circumstances; but 'tis true in general, that Women are of colder Tempers than Men, because their Humours and Spirits are cooler, and they generally lead more idle Lives, and use a more cool Diet; they have a softer Habit of Body, their Bloods are more serose, and their  
 Menfes

Menses cool them, as all Evacuations do.

In Children and Women the cooler and moister Diet is most agreeable to preserve their natural Pulses, and a hotter and drier Diet is most suitable to preserve that in Men; in moist or fat Habits the Pulse is soft; and in dry, hard.

3. In thin Habits of Body, the Pulse appears greater and stronger, but in the Corpulent smaller and weaker; in the thin Habits the Pulse is not so much oppress'd with Flesh as in the Fat; and the thin Habits are either Choleric or Hypochondriacal; and the Fat have a Phlegmatic and serous Temper, by which their Pulses differ. The exceeding Pulses in thin Habits shews they want a cold Regimen, and the fat Constitutions want the hot.

4. The solid Parts of old Men are dry and cold, the Fluids are cold and moist; both the Solids and Fluids of Children are hot and humid, or moist; all natural Constitutions must be preserv'd by a like Nutriment.

Old Men have small, slow, and rare Pulses, because their Spirits are weak and Blood cold, if they be of fat and cold Tempers; but the thin old, have small and frequent Pulses.

In Children the Pulse is very frequent, quick, and small; the Spirits are weak, tho' the Blood be hot. *Galen* makes the Pulses of Children great in respect to their small Arteries, tho' it be small in respect to the Pulse of Men; the great Heat, and the smalness of Vessels, makes their Pulse more frequent than that of Men; but it may be observ'd, that the Pulses of thin old Men, have as great a frequency as that of Children.

The Pulse of young Men is great and vehement, thro' the Strength of their Spirits, and their Bloods abound with Choler and Heat, and their Arteries and Heart large, which in Women and Children are too small for a great natural Pulse, and their Bloods are more serous and fluxile, and therefore easily propell'd by the Pulse; Crebrity is commonly joyn'd with all small Pulses; the Reason why Children are apt to Fevers, is, because their Pulse runs near the number of the Fever, through great Heat; by the Pulse in the Fingers, *Harvey* observ'd, that Children were Feverish: This he affirms to be a certain sign both in Children and delicate Constitutions; and since their Pulses are always quick and frequent, they are very much inclin'd to Fevers.

Note,

*Note,* That the Heat of Children is reckon'd equal to that of Men, but it is joyn'd with a greater Humidity than the other, whose Heat is more acrid and dry: Children have humid and hot Tempers from ferous Blood.

5. In the Spring the Air is more temperate, and the Spirits but moderately rarify'd, and the Blood moderately ferments, all which produces a great and stronger Pulse in the middle of the Spring, as well as in *Autumn*, when there is also a temperate Air; but when a greater degree of Heat happens, the Pulse is also quick and frequent, and at the end of the Spring the Magnitude and Strength decrease, as the Perspiration increases; so that in Summer the Pulses are languid, quick, and small, and frequent; the Spirits then become weak by too much Perspiration, tho' the Blood be then most rarify'd, on which the Celerity and Crebriety of Pulses depends, and the smallness and weakness on the want of Spirits; for all Evacuations if great, sink the Pulse; towards the latter end of *Autumn*, the Greatness, Vehemence, Celerity and Crebriety of the Pulse decreases; and in the beginning of the Winter the Pulse becomes smaller, weaker, more slow and rare.

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In hot Regions and hot Air the Pulse is as in Summer, and in the cold as in Winter; the natural, innate, vital Heat and Spirits is preserv'd by moderate Cold, which external Heat evaporates; but it stimulates the Circulation to a greater celerity and crebrity, the external Cold makes the Pulses greater by closing in the Heat, but extream Cold depresses the Pulse.

Near the Equator, the Air is most hot, and consequently the Pulses must be small, languid, quick, and frequent; and by my Computation, they will make 120 Beats in a Minute: About the 45 degree, the Air is most temperate, and the Pulse will beat most moderate, viz. 75 Pulses in a Minute. But in *England*, where we incline to the North 5 Degrees more, the Pulse will run betwixt 70 and 75; but under the Northern Pole, the Pulse will become smaller and weaker, but slow and rare by extream Cold, as it does in the Winter; and there the Pulse will beat but 30 Pulses in a Minute. See the Tables in the third Part.

Jan. 31. I found my Morning Pulse 83 in a Minute, after a moderate Exercise they were 100; but before Dinner, they were reduc'd to 76, which is my natural Pulse;



Pulse; but after Dinner they came to 86, at 8 a Clock at Night they were 82.

In Winter all cold Diseases increase, because the Pulse is then more rare and slow.

In Summer the acute Diseases rage most, because the Pulse is then most frequent; the secretitious Humours abound most, when the Season produces such Pulses as usually occasions them; so in Winter we gather the greatest quantity of Phlegmatic Lymphas from a crude Chyle, which is produc'd from a slow and rare Pulse: A quick and frequent Pulse in the Summer produces Cholera, the Evaporation of the watry *Serum* in the Summer produces a salt *Serum*: At the latter end of Summer the Heat is most excessive, and the Pulse most frequent, which produces the *Atrabilis* towards *Autumn*; the gradual increase of the Heat first produces Cholera, then *Saltrais*, and after a vitriolic *Atrabiliarian* Humour; a moderate degree of Cold produces a sweet Phlegm, a greater amucilaginous watry Constitution, and the greatest an *Acerbe* vitrious slime towards the coldest time of Winter.

The different Regions have Men of different Tempers, according to the Number of their Pulses, the most exact health-  
ful

ful Tempers are about the 45 degree of Latitude; these are fanguine, but the 50 degree is the first of the Phlegmatic Tempers, which is in *England* our most temperate Constitution; we must use a Diet inclining to Phlegm to preserve our natural Tempers; but if the Pulse exceed; we reduce it by a cool Diet, if it be deficient by a hot, in Winter, we use the hottest and most plentiful Diet in Summer, the coolest and most thin wa-  
try.

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C H A P.

## C H A P. V.

*Containing the alterations of the Pulse by the external Causes, called the Non-Naturals.*

**T**O a natural Pulse these three Things are necessary, a moderate Rarification in the Blood, a right Disposition in the circulatory Organ, and a moderate Influx of Animal Spirits to contract the Heart with a due force.

The Non-Naturals alter the Pulse by altering the Blood and Animal Spirits.

1. Hot Air rarifies the Blood and Spirits, and they stimulate the Heart to make a vehement contraction and quick circulation, which forces the Blood to return oftner, and stimulates the Heart to a more frequent contraction.

If the Heat of the Blood increase a little above the Natural, the Pulse becomes greater; but if it increases more, the Pulse becomes not only greater, but quicker; but if the Heat increases to the highest degree, the Pulse becomes very  
great

great and quick, and frequent. From this Observation I infer, That if I can measure the frequency by counting the number of the Pulses in one minute, I can thereby measure the Heat of the Blood, and I can also measure the greatness and celerity of the Pulse produced by that Heat.

A great and a quick and frequent Pulse are peculiar to hot Tempers, if the Spirits be strong which is requisite to make a quick and great Pulse; and if the Pulse be frequent 'tis a sign of Heat, tho' it be not great and quick.

Cold Air makes the Pulse more rare, slow and smaller, by condensing the Air contained in the Blood and Spirits, as the Cold condenses and sinks the Spirit in the Thermometer.

I sat in a cold Place one morning, *Dec.* 4th, Wind East, and my Pulse sunk to Beats.

In cold Seasons and cold Constitutions the Pulse being retarded, the Serum separates from the Mass of Blood, and produces cold Defluxions.

In hot Constitutions and hot Seasons the Defluxions are produced by Heat, which the quick, feverish Pulse demonstrates; and that forces the Serum through the  
Glands,

Glands, by rarifying of the whole Mass of Blood.

Cold makes the Spirits more sedate and less rarified, the degrees of Rarification and Condensation of our Humours we may discern by the Thermometer; which when it stands very high, it must shew a very frequent Pulse, as in Summer; and when low, a more rare Pulse, as in Winter. But the small changes of the Thermometer will not shew certain changes in the Pulse; for in *Nov. 21.* I found my Pulse at 86. when the Barometer stood at Storms, and the Thermometer at Frost. In *Nov. 3.* I observed the Barometer at Snow, and the Thermometer at hard Frost, and the Pulses then 72. By comparing these Observations I learnt that neither the Thermometer nor Barometer can give us any notice of the common Rising and Falling of the Pulse, tho' some alterations may happen when the Glass stands very high or low; 'tis Air, Diet and Secretions, which make the inequalities of Numbers every Morning, tho' 'tis certain the changes of different Climates make great variety in our Pulses, and so do the changes of our Seasons. See more of this in the Third Part.

I observed one day when the Thermometer rose 15 degrees, that the Pulse came from 72 to 82, after to 86 and 87, in a morning

The alterations of the Pulse by Baths may be referred to the alterations by the Air, which is altered in our Bodies by Baths. Moderate hot Baths produce great, quick, frequent, and vehement Pulses, by rarifying of the Blood and Spirits; so by Baths we may alter our Pulses, and we may restore a *ὕπερθε*, revive the Spirits, increase the natural Heat, and discuss some hot Spirits by them; for these Ends we may use them when we are very Hot to discuss hot Vapours, and when Cold to heat our Humours; and they relieve Weariness, and inequality of Temper, and help all our Secretions, especially that of Sweat. These are the Benefits of tepid Baths, which ought to be restored with the frictious and unctious used by the old Physicians.

Immoderate hot Baths make the Pulse small, languid, quick and frequent; and afterwards as we cool they become small, languid, slow and rare; the Pulse is made weak by the Evaporation of Spirits, but quick and frequent thro' the Heat of Blood, and at last the Pulse becomes formicant.

Cold

Cold *Baths* presently make the Pulse small, languid, slow and rare; and afterwards they strengthen or stupifie if continu'd too long: The cold Water produces these Effects by condensing the Air in the Blood and Spirits, if the *Bath* be so long continu'd as to stupifie, they make the Pulse more slow, small and rare; but if they be us'd moderately, they heat and strengthen, and afterwards the Pulse becomes great, vehement, quick and frequent, after the Chilness is over.

I have felt the Pulse before and after cold *Baths*, and have found some Pulses more rare, others more quick after cold *Baths*; and that in Summer the Pulse was stopt, but in Winter the Pulse was accelerated by them; so in warm Weather the Thermometer sinks by being immersed into a Spring, and in Winter it rises up to C in the Glass, if immersed into the same Spring; this Observation I must leave to ingenious Practicers to try how far it will hold, whether in all or some particular Bodies.

Some Persons are much surpriz'd by the cold Immersions, others Swim about and Labour; these Accidents make the Pulses to differ after cold *Baths*. Bathing after Dinner heats, in the Morning cools,

if continu'd a due time; the long Stoppage of Perspiration, *Galen* says, produces a *Plethora*, and encreases the natural Heat.

A great quantity of Meat oppresses the Blood and Spirits, and makes the Pulse unequal and inordinate; and among many great and vehement Pulses there will be many small and languid; but when there are more small and languid than great and vehement, 'tis a sign of a very great Oppression; but if the Pulse be small and languid, without a mixture of the contrary, 'tis only a sign of a decay of Spirits.

A moderate quantity of Diet makes the Pulse great, vehement, quick and frequent, because it rarifies the Air in the Veins of the Stomach and *Porta*, and thereby promotes the Circulation towards the Heart.

The hot Tastes in our Diet promote the Circulation most; such are the Acrid or Corrosives, as Mustard and Garlick; the Aromatics as Ginger; the Bitters as Hops; the Vinous Sweet ferment our Humours most, as all Malt Liquors, sweet Wines, Honey, and Sugar; so does also acrid and fetid Meats, as Oysters, Anchovies, Gravies, Cheefe.

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The cool Tastes in our Diet cool the Blood and Spirits, and Air contain'd in them; and thereby they stop the Fermentation and circular Motion; so drinking Water, slimy Plants, and the Acids, and *Acerbes* and Stiptics, cool all our Humours, and stop their violent Motions and Fermentations.

I have oft found my Pulse about 70 before Dinner in a Minute, after Dinner 86 or 90, as Flesh-meats and Strong-drinks accelerate the Pulse; so Water-drinking, Milk, Meats, Flower-meats, and cool Herbs, stop the Pulse; so when I have eat a Meal without any fermented Liquor, the Pulse is accelerated but 4 or 5 Beats.

I found the Morning Pulse to exceed near 10 Beats, if I drank Ale or Wine at Night; Fasting, and being very Cold, reduc'd my Pulse to 62, but it rose to 75 after Dinner; this Observation shews, that 'tis best to eat no Suppers in exceeding hot Pulses, except Water-gruel or Milk-pottage, or Wine and Water.

A sparing Diet changes the Pulse as a moderate Diet, but something less in greatness, celerity and frequency.

Wine makes the Pulse greater, and quicker, because it rarifies the aerial Bubbles

bles in the Blood; and a moderate quantity makes the Pulses quick and more frequent, tho' an Immoderate oppresses the Blood and Spirits, and makes the Pulse unequal.

I have oft admir'd that the Pulse should rise so soon after Dinner, before the Chyle can arrive at the Blood; this I impute partly to the actual Heat of our Diet, but chiefly to the *Peristaltic* motion of the Guts; the Heat of our Diet draws the Blood and Spirits towards the Guts and Stomach; for after eating they appear very Sanguine upon Dissections, the quantity of the Nutriment and Chyle fills the Guts and Stomach, and that excites the Peristaltic motion to press the Chyle thro' the Lacteals; and this pressure will accelerate the Reflux of the Blood thro' the subclavial Veins, and at the same time the actual Heat of our fermenting Meats in our Stomachs rarifies the Blood in the *Porta* and *Cava*, and so accelerates its Motion to the right Auricle of the Heart; therefore the Heats of our Pulses after eating are accelerated by promoting the Reflux of the Blood to the Heart: The motion and depression of the Diaphragm helps the motion of Chyle, and when the Stomach is full, the Lacteals receive a  
great

great pressure by Respiration ; but I cannot think it probable, that that helps Digestion, because Fishes and Birds want a Diaphragm, and yet Digest well ; 'tis certain, that the Reflux of Blood is promoted by the Chyle in its distribution and pressure thro' the Lacteals ; if the Experiment be true, that by blowing Wind into the *Ductus Thoracicus*, the Pulse of the Heart will be renew'd when 'tis stopt in a dead Animal ; and this shews what the pressure of new Chyle into the Blood can do, but the chief cause of the Acceleration of the Pulse after eating is from fermented Liquors, because when we do not use them, the Pulse is very little alter'd by our Diet.

If the Chyle be not perfectly digested, and its Fæces secreted, the Relicts of that Digestion cause the Pulse in a Morning to stand at the higher Numbers than usual ; but if any Evacuations happen by Urine, Sweat, Stools, Venery, they sink the Numbers of the Pulse, and make it undose or vermicular, as it happens in all Fluxes of Blood and *Serum*.

Great Hunger and Thirst are signs of the Expence of Humours and Spirits, which makes the Pulse languid, slow and rare ; but if they be moderate, the super-

fluorous *Serum* is spent, and the Spirits become acrid, and the Blood is more rarify'd, which makes the Pulse quick, strong and frequent.

Wine changes the Pulse sooner than the solid Meats, because 'tis sooner distributed, and the Change is more to a celerity and greatness; this Alteration ceases sooner than that from solid Meats, because 'tis sooner perspired.

The Pulse by moderate Exercise labours more, and becomes more vehement; and because the Heat and Rarification of Humours increases, it becomes great and quick, and at last very frequent.

If Exercise be much, and it exceeds, the Spirits are exhausted, and the Pulse becomes languid and small, and very frequent, by reason of the Heat.

If the Exercise be Immoderate with great Weariness, the Spirits and Heat are very much evaporated, and the Body cooled; and then the Pulse is very languid and slow, small and rare.

After half an Hours moderate Walking, in a Minute I have counted 112 Pulses; so that the Pulse was accelerated 20 or 30 Strokes in a Minute, and it fell again not long after the Exercise ceas'd; and before Dinner I counted but 70 Beats in  
a Mi-

a Minute; but after Dinner they were 90, before the Exercise in the Morning the Pulse was 76.

I rid 16 Miles in a cool Day, and the Pulse beat 90 in a Minute; therefore Walking is a greater Exercise than Riding, because it makes the Pulse beat faster.

The shortness of Breath upon Exercise stops the Pulse, and makes it irregular, smaller and weaker for some time.

A fat Man by Walking had 90 Pulses in a Minute, a thin Girl had a 110 by the same Walk, tho' the Morning Pulse was 75, and the Pulse sunk to the same Number before Dinner; after which the Girl of 12 Years had 83 Pulses as soon as she rose from the Table.

By frication of the Body, with Body-brushes, the Pulse usually rises 7 or 8 Beats in the Winter, but they did not continue above half an Hour; the frication was us'd in the Morning.

Sleep in the beginning makes the Pulse lesser and slower, and more languid and rare, because at first the nutritious Juices oppress the Animal Spirits which then are much spent, and after replenish'd by Sleep; and all voluntary Motion ceases in our Sleep, which accelerates the motion of the Pulse; if Sleep be continu'd too

long, the rarity and slowness of the Pulse increases; but when the great quantity of Chyle is perspir'd, and all other Secretions are perform'd, after a perfect Digestion of them, the Spirits are more increas'd, and the Blood is well rarify'd; so that the Pulse in the Morning sinks to its natural Number, and they become great and strong, more slow and rare than they were in the Night, or in the beginning of Sleep.

The Pulse of those who awake is great, vehement and quick, little disturbed, which makes it vibrate, but that soon settles to a moderate and natural Pulse, if the digested Humours and their Secretions be rightly perform'd, the Animal returns to the same Pulse and Weight; but the want of Digestion and due Secretions makes the Morning Pulse to differ, as well as the Weight of all Bodies; but I could not observe that the Weight of the Body and the Pulse did correspond in their alterations exactly.

In Sleep the prone Posture of the Body makes the Circulation easie, and no more Spirits are spent than what are necessary to the naturally continu'd vital Motions, as that of the Pulse and Respiration; and the Motions necessary to distribution of  
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the Chyle, and Secretions thro' the Glands and Laeteals, after long waking the Body is heated, and the Spirits are spent, and want a diluting Moisture; much Nutri-ment makes us Sleepy as well as Weari-ness, and all Evacuations and a Preterna-tural Humidity makes us Comatose; long Waking spends the Spirits, and makes the Pulse small, weak, slow and rare; but an excess in Waking produces the Pulse of an Ephemera; a moderate Waking only spends the excess of *Serum*, which clogs the Spirits, and then the Spirits become more rarify'd and active, and the Pulse becomes more quick, frequent and strong, when we Awake in a Morning.

As natural Sleep proceeds, the Pulse becomes more rare and slow, and acquires a greater Magnitude and Vehemency till Morning; but if the Sleep be then continu'd too long, the greatness and vehe-mency remit, and the Pulse remains more slow and rare.

In Sleep the Blood circulates more in the great Vessels, and being less circula-ted thro' the Muscles in the Habit the Stream is turn'd more towards the Sto-mach and *Viscera*, which is the reason that Concoction is made better in the Stomach and Veins during Sleep.

In the Passions of Anger the Pulse is great, vehement, quick and frequent.

In Joy the Pulse is great, rare and slow, and not vehement, if the Joy be moderate; but in the Immoderate the Spirits are dissipated or diverted, and the Pulses are contrary.

In Sadness the Pulse is small, slow, languid and rare; the Spirits by a convulsive Constriction of the Heart stop the Pulse; but in Joy and Anger the Spirits are much rarify'd, and flow violently, and in great quantity into the Muscles of the Heart, to contract them with great force.

Great and sudden Fear makes the Pulse inordinate, unequal, quick and vibrating; but if Fear continue long, it has the same Pulses as Sadness.

All immoderate Passions agitate the Spirits too much, and spend them, and render the Pulse small and languid.

A great Contention of the Mind spends the Spirits, but if it be moderate, it only spends the Humidity of the Lympha or nervous Juice.

The Pulse in the Melancholic from Passion is obscure, contracted, inconstant, unequal, having an appearance of a deficient Pulse, and 'tis sometimes vermicular.

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The Pulse in melancholic Constitutions is generally hard, slow, and rare, and small; the Blood is thick, and the Spirits weak, when they have Vapors, the Pulse is like that in an Ephemera.

I counted the Pulse after a great Passion of Anger, and it beat 104 in a Minute by drinking a Glass of Water, and fasting till Dinner; and sitting in a cool Place it sunk to 80, but the Pulse did not sink lower for 3 or 4 Days; this I take to be a Description of the Vapors from Resentment, when very great; and such Fits are true Ephemera's from Passions, and sometimes there is produc'd a hectical Fever from Sadness.

An unequal vibrating Pulse is a sign of some Passion, and this inequality may depend on the Constriction of the Vessels.

In a Mania the Pulse is hard from an abundance of bilious Blood; in a Mania from Atrabilis the Pulse is hard both from Heat and Tension, and the Pulse is small because of the Tension and Hardness; they are also quicker, and more frequent from the Fever and Atrabilis.

They who endeavour to suppress their Anger, have very unequal Pulses; and so have they who are in any Trouble, and  
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are aſham'd, and there is a Vehemence in their Pulſes.

I have oft obſerv'd an inequality in the Pulſes of a Lady, who was much concern'd for her Child's Life; many Pulſes were more frequent, and others rare.

The Pulſes in the hot Diſeaſes of the Head depend on a ſanguine or bilioſe Cacochymia, and a Coma and Dropſie of the Head on a ſerous Cacochymia; and theſe are known by the Pulſe belonging to each Cacochymia, and in Melancholics the Pulſe is weak and rare; in hot Diſeaſes, great, quick and frequent Pulſes.

We find that Fear hinders the Circulation, becauſe the Fearful will not Bleed after the Vein is open'd; Modeſty and Shame ſtops the Circulation alſo, as we diſcern by the Redneſs of the Face; ſolicitude of Mind is joyn'd either with Fear, Anger, or Joy, and accordingly it alters the Pulſe. Anger, Joy and Contention of Mind accelerate the Circulation; Fear, Sadneſs, Melancholy ſtop it.

All violent Paſſions alter the Pulſe by agitating the Heart vehemently in its Conſtriction; but if they continue long, and are vehement, they ſpend the Spirits, and produce weak, ſmall Pulſes.

The Ancients imputed Fatuity to the Refrigeration of the Head, with which the Heart consents, and produces smaller, slower, and more rare Pulses. In these cold Defluxions the Pulse is soft from a Phlegmatic, hard from a Melancholic Cacoehymia, which infect the Spirits.

The alteration of the Pulse by Exercise soon cease, those from Wine and Diet last longer, and they are known by the vehemence and greatness of the Pulse.

The greatness and vehemence of the Pulse increases till the Nutriment is digested, and as soon as we have Eat they begin to rise.

Hot Medicines produce high Pulses, but they in time sink again.

In the first degree of Heat the Pulse is greater, in the second quicker, and in the third more frequent.

In the first degree of Coldness the Pulse becomes more rare, in the second more slow, and in the third degree the Pulse is less.

By our Pulse we know, that hot Air, hot Cloths, and hot *Baths*, and hot Meats, and fermented Drinks, plentiful Eating, variety of Meats, of bitter Acrid, salt  
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fætid Tastes, or Aromatics, as well as Watching, stopping of Excretions and hot Passions, heat and over-rarifie both our Bloods and Animal Spirits, and consequently accelerate our Pulses; and on the contrary by deficient Pulses we know that cold *Baths*, cold Diet, Rest, Evacu- ations, much Sleep, cold Cloths, and Air, and the Passions of Sadness and Fear, sink the Pulse; therefore we use these in the cold Regimen, and the former in the hot Regimen.

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## C H A P. VI.

*Containing the Alterations of the Pulse  
by Diseases.*

1. **I** Have describ'd the natural Tempers of Humours, and the natural Constitution by the secretitious Humours, the Cholera, and salt *Serum*; the Lactéal or Phlegmatic Lympha, and the *succus Melancholicus*; the mixture of these secreted Humours makes the Cacochymias, and their being over-digested or too Crude.

2. The Cholera becomes very bitter, and very viscid and acrid, and this makes the choleric Constitution; and the Pulse runs betwixt 75 and 80, and the Habit of the Body is plump, and high sanguine, florid in the Face.

3 The Cholera is mixt with Saltness, as in a Lixivium, which is Bitter and Salt, and the Pulse runs betwixt 80 and 85; the Saltness may be render'd very acrid or corrosive by too much Heat, which evaporates the watry Part, by which the Saltness is diluted.

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4. The Cholera may be mixt with a sharp acid, but the great bitter and acrid must prevail more than the sharp acid; and this makes the Atrabilis, the Pulse is betwixt 85 and 90.

5. The phlegmatic Cacochymia is known by the deficient Pulses, as the Choleric is by the exceeding; and the phlegmatic lacteal Lympha may be too Crude, as in phlegmatic Constitutions, which makes the Pulse betwixt 70 and 65.

6. The phlegmatic Lympha may be mucilaginous, and mix'd with a crude Serum, as in Anasarca; and in this Cacochymia the Pulse stands betwixt 65 and 60.

7. The *Acerbity* of the *succus Melancholicus* is mixt with the phlegmatic and lacteal Lympha, and within this four phlegmatic Cacochymia, the Pulse stands betwixt 60 and 55.

The hot bitter Acrids, are the hot and humid Constitutions of the old Writers, the Salt, and Atrabiliarian are the hot and dry. The sweet lacteal Lympha being too crude, is the phlegmatic Constitution, the serous and phlegmatic Lympha is the cold and humid. The *Acerbe* Phlegmatic, or vitrious Lympha, is the  
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dry and cold Constitution, and this is the coldest and crudest of Humours.

We find the Pulse of most Persons upon divers external Accidents, tho' they be naturally of a choleric, salt, or Atrabiliarian Temper, will run some of the lower numbers of the Pulses, by which I conjecture the choleric and cold Cacochymia may be mixt, if with Blood, the Cholera is then Red or Sanguine; if the Cholera be mix'd with the crude lacteals Lympha, the *Bilis Pallida* may be observ'd; if the Cholera be mix'd with a crude Serum, the *Bilis Serosa* is produc'd; if with salt Serum, the *Bilis ceruginosa*. If the Cholera be mix'd with the *Acerbe* melancholic Juice, the *Bilis Porracea* is produc'd. These are the several Species of Cacochymia from Cholera, mix'd with all the other Humours. The old Writers call'd these the different Species of cacochimical Cholera, viz. *Bilis rubra*, *Pallida*, *Vitellina*, *ceruginosa*, *Glastra* or *Atra*, so the *Pituita* is mix'd with the other Humours; with the melancholic Juice 'tis call'd *Pituita Acida*; with the Serum, when crude or mucilaginous, 'tis call'd *Pituita Insipida*; with Blood 'tis call'd *Pituita Dulcis*, with Cholera 'tis *Pituita Amara*, with salt Serum 'tis call'd *Pituita Salsa*, and with Melancholy 'tis

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call'd *Pituita Acidoacris*, or *Corrasiva*; the *Serum* and *Succus Vitriolicus Melancholicus*, may be over digested, or very crude. And there are four Differences reckon'd of *Atrabilis*, the first when mix'd or bred out of natural Melancholy, which is the *Atrabilis* bred from melancholic Juice; the second is *Atrabilis* bred in a choleric Blood, *Atrabilis* bred in sanguine Tempers; the fourth is *Atrabilis*, bred in a salt Blood. To these may be added *Atrabilis*, joyn'd with Phlegm, or bred in a phlegmatic natural Constitution, and *Atrabilis* joyn'd with *Serum*; and there are reckon'd four Species of cacochymical *Serum*, *Sanguineum*, *Biliosum*, *Pituitosum*, and *Melancholicum*, to which I must add viscid *Sulsum*, and *Aqueum* or *Mucilaginosum Insipidum*. In the mixture of the *Cacochymias*, we must first consider what is the natural Temper of any Person, and the *Cacochymia* to which he is subject; then we must call that the acquir'd *Cacochymia*, which is afterwards joyn'd with the former; and from the Composition of two *Cacochymias*, or three, or all four, many Diseases are produc'd; not only the several hot *Cacochymias* may be joyn'd, but the several cold *Cacochymias* may be mix'd among themselves; but also the contrary



trary Cacochymias are miscible, as when a hot Constitution becomes Hydropical, or cold Melancholic, or when a cold Constitution runs into a Fever; in all these Cases the Pulses must be mix'd, and that Cacochymia which prevails, will incline the Pulses to it.

These Cacochymias are the Antecedent Causes of Diseases, and if we know their Pulses, we may know the Cause of the Disease in general; but cannot tell the Part affected, but by the Changes of its natural Qualities, or its Actions, or Excretions, Neighbourhood, Office, Situation, Connexion, by which we must know the Part affected.

From the several Cacochymias, the several Intemperies are produc'd, as *Calida*, *Frigida*, *Humida*, *Sicca*; and the Compounds of them, as the *Calida Humida*, *Sicca Frigida*, *Humida Frigida*, and *Sicca*; these may be known by the Pulse, but by the Pulse we cannot know the organic Diseases in Conformation, as when the Figure, Cavity, Asperity, and Levity of any Part is alter'd; neither can we know when the Magnitude is increas'd or decreas'd, nor whether the Number of Parts exceeds or is deficient, nor whether the

Situation be alter'd, nor the Connexion nor the Tone relax'd.

Neither can we know the *Morbus Communis*, or *Solutio continui* in the Flesh, as Wounds, Ulcers, Contusions; nor that in the Bone, as Fractures, Fissures, Caries; nor in the Nerves, as Punctures, Sections, nor the Ruptures of the Veins and Arteries, nor Membranes, nor the Excoriation in the Skin; but we may know Pains by the Pulse, we know in general Evacuation by the Pulse, but cannot tell by what Part it is made, nor in what Part the Pain is seated.

Tho' we know the Temper and Strength of the Animal Spirits, yet we cannot know all the Animal Actions by the Pulse; so we cannot know the Faults in the Judgment, Memory, Imagination; nor the defects in the Senses, as Blindness, Deafness, by the Pulse; but we may fully know the vital Actions of a healthful Circulation and Respiration by the Pulse; but we cannot know the natural Actions alter'd by the Pulse, as Nutrition, Hunger, Thirst, Generation, nor the Tone of the solid Parts. From all the former Reflections I conclude, that the Diseases of the fluid Parts in the Blood and Spirits are chiefly  
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to be found out by the Pulse ; but the organic Diseases, and the solution of Unity, must be known by the Signs of the particular Diseases obvious to our other Senses, as by the Qualities changed, the Actions abolish'd, diminish'd, or depriv'd, and by the Excretions from any Part, &c.

1. The Diseases which depend on a *Plethora* of Blood, and other Humours may be known by a great, full, hard Pulse, very strong, and slow, and rare moderately ; the defect of Humours we discern by a slow, weak and soft, or empty Pulse ; as 'tis also very slow and rare, unless some feverish Beat happen, and then 'tis quick and frequent ; the Pulse is slow and rare in a *Marasmus* without a Fever.

2. At the Number of 95 or 100, I generally find all the Effervescences of Humours, which produce Defluxions, Pains, Rheumatisms, Inflammations, Asthmas, Gouts, and all Fevers.

In Pains in their beginning the Pulse is great and strong, and quick and frequent whilst the Strength lasts ; because the Spirits being agitated by it, they expand and rarifie themselves, and then violently contract the circulatory Organs, and quicken the Circulation to expel any thing which

offends any Part, for which Reason we say, that Pain draws Humours to a Part, or rather by a Constriction retains them in the pain'd Part; after the long continuance of the Pain the Pulse is made languid, quick and frequent, and at last ends in great Languor, Smalness, and great Crebrity, which usually accompanies all small Pulses; if the Pains be in a nervous Part, the Pulse is small, hard, quick and frequent; the greater the Pain is, the more the Artery is stretch'd like a Cord, and the Pulsations are unequal, intermitting, deficient, as well as very frequent, small, languid; Pain is a convulsive Passion, and contracts the Parts it affects.

The Pulse in the Gout is great, quick and frequent, which shews the Effervescence of Humours in the Fits by an Ephemera, or intermitting Fever; and with the one of them, the Gout is always joyn'd.

In the hot sanguineous and choleric Tempers, the Pulse in the Gout is more strong and quick; but in the pituitous and melancholic Gout the Pulse is more rare and slow; the Gout is a Defluxion of salt *Serum* thro' the mucous Glands of the Joints.

In great Catarrhs and Coughs there is a Defluxion thro' the Glands, caus'd by an Ephemera, or intermitting Fever; and the Pulse is as in those Fevers, great, quick and frequent. I have counted a 100 Pulses in a Minute in Colds, but it soon fell in three or four Days to 80; whilst I had a Cold this Winter, my Pulse stood from 80 to 90 in a Minute.

Small Pain without Inflammation, and in external Parts alter not the Pulse; but great Pains with Inflammation, and in principal Parts alter the Pulse, as in Fevers.

Pains at the Stomach make the Pulse unequal, languid, frequent; small Pains from the hot Cacochymia have exceeding Pulses; but from the phlegmatic, serous or cold windy Cacochymias, the natural Pulse is very little alter'd.

In the beginning of Inflammations, the Pulse is great and quick, and more frequent, and vehement; and as it increases, these increase with a Hardness and Vibration; in the State the Pulse is more hard and vibrating, but less, but not more languid, till the Spirits are spent; 'tis also more quick and frequent, but when the Spirits are spent, 'tis hard and small.

The nervous Parts are more sensible of Pain, and make the Pulse more hard, less and ferrine; they are more tense and hard by contracting and stopping up the Passage thro' the Artery. The nervous Parts in Pain constringe the Membranes, and all the Vessels in them, and there is a Fever joyn'd with all Inflammations as well as a Pain; and the Blood being sily is more easily stopt in the end of the Arteries, and by that means keep it full and hard; Inflammations in the fleshy Parts have less Pains, greater Pulses. A dense and hard Part makes hard Pulses, if inflam'd, it makes them more hard, as soft Parts make soft, and so much the more so, if they be relax'd by moist Diseases; in the Inflammation of the Liver, Spleen, Reins, Bladder, there is the like Pulse; but some Symptoms may alter the general Pulse, so they whose Diaphragm is inflam'd are subject to Convulsions; if the Lungs be inflam'd they are subject to Suffocations; if the Mouth of the Stomach, to a Syncope; if the Liver, to an Atrophy; if the Stomach it self, to a nidorose Crudity; if the Reins, to a suppression of Urine; and by these Symptoms the general Pulse of Inflammations is alter'd. Small Inflammations, and those in

Parts

Parts not sensible of Pain, alter the Pulse less.

If an Inflammation ends in a Schirrus the Pulse is small, because the Fever and Pain are over; but the Pulse is hard, because the Schirrus stops or compresses the end of the Artery, and there gathers the sily Blood.

The Pulse in most Inflammations is hard and ferratile, except in Peripneumonias, and Lethargies, in which the Motion thro' the Head and Lungs being retarded, or a little stop'd, the Artery must remain more empty; and the sily Blood sticks in these inflam'd Parts, and the other Arteries become more soft.

In the Inflammation of the Lungs the Pulse is great, languid, soft, like the Lethargies, but quick and frequent; 'tis unequal disturbed, stop'd, undose, and sometimes intermits, and is intercurrent; when the Fever runs high, the Pulse is Feverish, but when there is something of a Coma joyn'd with the Fever, then the Pulse is less frequent; the inequality depends on the compression, constriction, or fulness of the pulmonic Vessels; 'tis sometimes *Dicrotus*, but rarely, and 'tis not hard.

In the Inflammation of the Liver the Pulse is quick, frequent, hard and vibrating.

In a Quinsie the Pulse is great, frequent, quick, because of the Fevers; 'tis undose as in a Peripneumonia, to which a Quinsie frequently tends; 'tis said to be Tensive or Convulsive as in Inflammations. If there be a Suffocation the Pulse is rare and small, and at last frequent and unequal; if the Tension prevail, it ends in Convulsions; if the Peripneumonia, it ends in that.

In the Pleurisie, as well as in other membranous Inflammations, the Pulse is hard from the sizyness of Blood, and also from the Pain which constringe the Arteries; the *Pulsus Sarratus*, I apprehend to be from the Reverberation in the Artery, the Blood being obstructed in the end of it, so that it strikes the Fingers both in going down the Artery, and after Reverberation, and that may make the appearance of a Saw: In this Pulse *Galen* says, one part of the Artery is higher than the other.

The Pulse in the Pleurisy is also quick and frequent, and not very great, neither languid, nor vehement; the quickness and frequency depend on the Fever, which is higher in the Biliose than the pituitous

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Constitutions, the hardness hinders the greatness; when the Artery is kept full, the Distention cannot be much more, nor easily perceiv'd; the biliose Tempers are more prone to a Delirium, the phlegmatic to a Coma, and these alter the Pulse; when the Pulse becomes more frequent, it turns to a Peripneumonia, or Sincope; when more rare, to a Sopor or Convulsion. If the hardness be less, 'tis a sign that the Matter will soon ripen; if the hardness be great, 'tis a sign of much Matter, and a crude Pleurisy; and if the Spirits be weak, 'tis more dangerous; but if they be strong, it will hold long in Maturation, or end in a Pthysu or Suppuration.

The beginning of Suppuration is in the State of an Inflammation, and is like that Inflammation, vibrating and hard; and this is a sign of inward Inflammations, as well as outward; when the Matter is digested, the feverish Pulse remits, and it remains Hectical; the Pulse is oppress'd and unequal, sometimes great, vehement and quick, when the Blood is infected by the purulent Matter; but when the Spirits are faint, and the Matter discuss'd by Sweat or Loosness, the Pulse becomes the contrary; when the Impost-  
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hume breaks, the Pulse is languid, slow, rare, because Vomiting and Swooning happen then, after the Pus stimulates great and vehement Pulses.

The Pulse in a Pthysis is usually small, languid, quick, and very frequent and soft, the Spirits are weak, the Fever is hectic, and they usually have 100 Pulses in a Minute in hectic Fevers; there is an outward Inflammation in the Lungs, which accelerates the Pulse as well as the Fever, which is continu'd by a putrid Sanies in the Tuberculas, their Blood is fizy, as in all Inflammations. The Evacuations make the Pulse soft.

In all Marcors from an obscure Inflammation in the Lungs, or from a Syncope of the Stomach and Heart, the Pulse is languid and frequent, which the *Galenists* call *nutantem Pulsam*; but the Marcor of old Men makes the Pulse rare, till an Extream weakness makes it frequent, when the Pthysu is chronical, and the Constitution cool, and there are many crude Tubercula with little Impossthumations; I have observ'd the Pulse to run about 80, but as the Pthysu declines, the Pulse runs above 100, and especially in the Fits of the Hectic.

The Pulse of the Phrenetic is small, rarely great, and because the Membranes are inflam'd 'tis hard, and very quick and frequent, which the Fever occasions; the Spirits are spent by violent Motion, or the Brain is oppress'd by much Blood, which makes the Pulse weak, it seems to tremble, and to be cut off with a Convulsion; this Trembling is from a general Convulsion, which sometimes lifts the Artery up, and pulls it down; its Crebrity is a sign of a Syncope, the Pulse is seldom undole, because the Artery is hard, and the Inflammation is from a biliose Humour, the Blood is very florid, and is found upon Dissection in great quantity in the Head.

The Pulse in a Lethargy is like that in a Peripneumonia in greatness, weakness and softness, but 'tis slower, and more rare, and less unequal, intermitting more than intercurrent; 'tis undole in all Sopors from the oppression in the Brain, the Blood is very sily, as in the Peripneumonia, and the Lethargy requires frequent Phlebotomy; this Siziness the old Writers call'd the pituitous Humour, because 'tis the Chyle thicken'd, as in other Inflammations; and I reckon the Lethargy a Species of Inflammation, and has usually a Fever

ver joyn'd with it, because the Blood is stop'd in the Brain, the Pulse is soft as in the Peripneumonia.

In a Coma, or mix'd Case of Lethargy and Phrensy, the Pulse is oppress'd, the Spirits are much agitated by the Phrensy, the Pulse is observ'd to be undose in comatose Affections; but if it incline to the Phrenetic, the Pulse is harder, quick, frequent; if to the Lethargy 'tis softer, and the Pulse is less quick and frequent than in the Phrensy, and less strong; but they are not cut off by a Convulsion as the Phrenetic are.

The motion of the Spirits is oppress'd in a Lethargy, and tho' the Inflammation would make the Pulse great, quick and frequent; yet the Oppression alters it to languid, soft, undose, and intermitting; the Pulse is the same in a Catoche, as in a Lethargy; but 'tis not so weak, soft, and unequal.

A Rheumatism is a general Inflammation of the Limbs and fleshy Parts with a Fever, and great Pains, and have the same Pulse as they. I have observ'd many rheumatic Pains without Hardness, as they are sometimes without Fever.

In the Inflammations of the Bladder and Womb, the Pulse is said to be hard.

In an Iliac Passion there is great Pain and Inflammation of the Ileon, and a Fever is ordinarily joyn'd with it.

The Pulse in the Inflammation of the Diaphragm is observ'd to be small, hard, very much, and very frequent, with a Delirium.

In the *Cholica biliosa*, the Gut is inflam- ed, and there is a feverish Pulse: The In- flammations of the Muscles of the Belly will not make a hard Pulse, but great, quick, frequent.

The Apoplexy is an Inflammation of the Brain, and a Palsy is an Inflammation on the Nerves, and both joyn'd with an intermitting Fever in the beginning; and the Blood is sizy in both, and that occa- sions that Stagnation which oppresses the Brain and Nerves, and hinders the Efflux of Animal Spirits into the Muscles; whilst the Spirits are strong, the Pulse is great, and strong and quick, as in Fevers, and 'tis hard as in other Inflammations; but if the Spirits be much oppress'd, the Pulse is unequal, intermitting, slow, rare; and in a vehement Apoplexy, the Pulse is lan- guid, small, and quick and hard.

In the Palsy the Pulse is small, slow, rare, soft, languid; when the Spirits are much oppress'd, the Pulse inordinately in-  
termits

termits through the weakness of Spirits ; but in the beginning of the Palsy, the Pulse is feverish and frequent, and the Blood is very sily, as in all Apoplexies ; and that Siziness moves thro' the Blood-Vessels to the *Medulla oblongata*, as the Apoplexy clears up, and recovers, and after sufficient Bleeding and Glisters for the cure of that Inflammation, we ought to prescribe the Cortex in Apoplexies and Palsies, for the Intermitting-Fever joyn'd with them. I have found Purging very mischievous to Paralytics in the beginning in great weakness, the Pulse is frequent, and inordinately intermits. At 100 Pulses in a Minute we usually find all Fevers, whether Hectic or Putrid, and all the Defluxions are from 95 to 100, and Pains of the Head and Joints if great.

In hot or cold Diseases of the Lungs, and in all Defluxions on them the Pulse is unequal, because the Blood stops on the Lungs, and the Vessels are compress'd by the Defluxion especially, if the Humour be thick and viscid.

The Asthma is a Defluxion, and the Pulse in thin hot Tempers beats about 95, 'tis frequent, small, weak, intermitting ; the frequency and quickness demonstrates the Fever which accompanies the Asthma,

as well as other Defluxions; the oppression on the circulatory Vessels makes the Pulse unequal and inordinate, and somewhat deficient; a great Orthopnea makes the Pulse frequent, but a violent slow, and deficient; a fatal Fit makes it frequent and languid: I observ'd that in a great Cold that is joyn'd with the Asthma, the Pulse runs to a 100, and does not soon return to the natural Number under three or four Days; but as it goes off, it shrinks every Day a little; first towards 90, then 80; and so to the natural, if the Spirits be weak, the Pulse is not quick, but frequent.

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has the Pulse alter'd by the Symptoms attending it; but if 15 or 20 Beats increase above the natural Number, 'tis a Fever.

In continu'd putrid Fevers, the Pulse is greater, and quicker, and more frequent, and full, and unequal, as the Heat is; but in diairy Fevers the Pulse is equal, because the Heat continues the same from the beginning to the ending.

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crease of the Fit, the Pulse is quick and frequent.

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In a malignant Fever the Pulse is unequal, small, and languid, for want of Spirits, and very frequent; the Pulse is various, as to strength, weakness, greatness, and smalness, rarity, and frequency; and the anxiety, trembling, palpitation, and intermission of Pulse, are sometimes from Blood too Viscid for Motion, or from weak or oppress'd Spirits.

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gine they have no Fever; but 'tis certain, the Fever may be observ'd by the acrid Heat; and the Pulse is but a little chang'd from the natural *Δοσυσία*, so that it is not greater, and sometimes not more frequent; but it always has a greater Celerity, and is weak; and at first it was Feverish, but not always alike; we discern the Putrifaction in Diseases by the fætor of the Sweat, Urine, Stools, and Stinking-Breath.

The Pulse in the *Hydrophobia* is small, unequal, and Convulsive.

*Note*, That intermitting Fevers have a quick Pulse during the intermission or remission of the Fever; in Agues, during the intermission, the Pulse is more natural; but in Quartans 'tis more rare and slow, than in other Fevers; during the intermission, as well as in the Fits; and in this Fever the Spleen is affected.

In the beginning of Fever-Fits without Sicknes and Coldness, the Pulse is great and quick; but as it increases, 'tis very frequent; but if the Fever-Fits begins with Nauseousness, Vomiting, Rigour, Horrour, Heaviness, the Pulse is unequal, small, and languid; because the Stomach is affected, and the Cold also makes them slow.

*Galen* affirms, That the true Sign of the coming of the Fits is the Celerity of the Contraction, since this is not discernible of it self; we must consider the Celerity of the dilatation of the Pulse, as the more certain Sign; and where the Distention is quick, the Contraction must be so too.

We know Inflammations from putrid Fevers, because in them the Pulse is hard; in Hectics the Pulse is never great and vehement; the diairy Fevers have great and vehement Pulses, but the putrid is known by the Celerity of the Pulse, which is the chief sign of Fevers.

If the Fits come with Coldness, the Pulse is small, slow, and rare; but as the Fit increases, the Pulse becomes great, quick and frequent.

In the *Elephantiasis* the Pulse is weak, slow, small, but frequent from the weakness of Spirits; but 'tis not so till the Disease has continu'd long; in all putrid Humours, the Spirits are weak, and the Breath is fætid, as well as the Urine and Stools; in great weakness the Pulse is small, languid, rare.

In the Scurvy the Pulse is unequal, sometimes weak, small, formicant; and at other times great and hard, as in the

hume breaks, the Pulse is languid, slow, rare, because Vomiting and Swooning happen then, after the Pus stimulates great and vehement Pulses.

The Pulse in a Pthysis is usually small, languid, quick, and very frequent and soft, the Spirits are weak, the Fever is hectic, and they usually have 100 Pulses in a Minute in hectic Fevers; there is an outward Inflammation in the Lungs, which accelerates the Pulse as well as the Fever, which is continu'd by a putrid Sanies in the Tuberculas, their Blood is sily, as in all Inflammations. The Evacuations make the Pulse soft.

In all Marcors from an obscure Inflammation in the Lungs, or from a Syncope of the Stomach and Heart, the Pulse is languid and frequent, which the *Galenists* call *nutantem Pulsam*; but the Marcor of old Men makes the Pulse rare, till an Extream weakness makes it frequent, when the Pthysu is chronical, and the Constitution cool, and there are many crude Tubercula with little Imposthumations; I have observ'd the Pulse to run about 80, but as the Pthysu declines, the Pulse runs above 100, and especially in the Fits of the Hectic.

The Pulse of the Phrenetic is small, rarely great, and because the Membranes are inflam'd 'tis hard, and very quick and frequent, which the Fever occasions; the Spirits are spent by violent Motion, or the Brain is oppress'd by much Blood, which makes the Pulse weak, it seems to tremble, and to be cut off with a Convulsion; this Trembling is from a general Convulsion, which sometimes lifts the Artery up, and pulls it down; its Crebrity is a sign of a Syncope, the Pulse is seldom undose, because the Artery is hard, and the Inflammation is from a biliose Humour, the Blood is very florid, and is found upon Dissection in great quantity in the Head.

The Pulse in a Lethargy is like that in a Peripneumonia in greatness, weakness and softness, but 'tis slower, and more rare, and less unequal, intermitting more than intercurrent; 'tis undose in all Sopors from the oppression in the Brain, the Blood is very sily, as in the Peripneumonia, and the Lethargy requires frequent Phlebotomy; this Siziness the old Writers call'd the pituitous Humour, because 'tis the Chyle thicken'd, as in other Inflammations; and I reckon the Lethargy a Species of Inflammation, and has usually a Fever

ver joyn'd with it, because the Blood is stop'd in the Brain, the Pulse is soft as in the Peripneumonia.

In a Coma, or mix'd Case of Lethargy and Phrensy, the Pulse is oppress'd, the Spirits are much agitated by the Phrensy, the Pulse is observ'd to be undose in comatose Affections; but if it incline to the Phrenetic, the Pulse is harder, quick, frequent; if to the Lethargy 'tis softer, and the Pulse is less quick and frequent than in the Phrensy, and less strong; but they are not cut off by a Convulsion as the Phrenetic are.

The motion of the Spirits is oppress'd in a Lethargy, and tho' the Inflammation would make the Pulse great, quick and frequent; yet the Oppression alters it to languid, soft, undose, and intermitting; the Pulse is the same in a Catoche, as in a Lethargy; but 'tis not so weak, soft, and unequal.

A Rheumatism is a general Inflammation of the Limbs and fleshy Parts with a Fever, and great Pains, and have the same Pulse as they. I have observ'd many rheumatic Pains without Hardness, as they are sometimes without Fever.

In the Inflammations of the Bladder and Womb, the Pulse is said to be hard.

In

In an Iliac Passion there is great Pain and Inflammation of the Ileon, and a Fever is ordinarily joyn'd with it.

The Pulse in the Inflammation of the Diaphragm is observ'd to be small, hard, very much, and very frequent, with a Delirium.

In the *Cholica biliosa*, the Gut is inflamed, and there is a feverish Pulse: The Inflammations of the Muscles of the Belly will not make a hard Pulse, but great, quick, frequent.

The Apoplexy is an Inflammation of the Brain, and a Palsy is an Inflammation on the Nerves, and both joyn'd with an intermitting Fever in the beginning; and the Blood is sily in both, and that occasions that Stagnation which oppresses the Brain and Nerves, and hinders the Efflux of Animal Spirits into the Muscles; whilst the Spirits are strong, the Pulse is great, and strong and quick, as in Fevers, and 'tis hard as in other Inflammations; but if the Spirits be much oppress'd, the Pulse is unequal, intermitting, slow, rare; and in a vehement Apoplexy, the Pulse is languid, small, and quick and hard.

In the Palsy the Pulse is small, slow, rare, soft, languid; when the Spirits are much oppress'd, the Pulse inordinately intermits

termits through the weakness of Spirits ; but in the beginning of the Palsy, the Pulse is feverish and frequent, and the Blood is very sily, as in all Apoplexies ; and that Siziness moves thro' the Blood-Vessels to the *Medulla oblongata*, as the Apoplexy clears up, and recovers, and after sufficient Bleeding and Glisters for the cure of that Inflammation, we ought to prescribe the Cortex in Apoplexies and Palsies, for the Intermitting-Fever joyn'd with them. I have found Purging very mischievous to Paralytics in the beginning in great weakness, the Pulse is frequent, and inordinately intermits. At 100 Pulses in a Minute we usually find all Fevers, whether Hectic or Putrid, and all the Defluxions are from 95 to 100, and Pains of the Head and Joints if great.

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In the Scurvy the Pulse is unequal, sometimes weak, small, formicant; and at other times great and hard, as in the

hot Scurvy, in which the Blood is fizy; and there is a tendency to an Inflammation; the Pulse oft intermits, because the Blood is thick, and the Spirits move irregularly. The Itching and Formication in the Skin depends on the saltness or volatile Acrimony of Blood, or rather its *Serum* is evaporated, and very Salso acid.

In the Worms the Pulse is unequal, thro' the Irritation by them; 'tis sometimes Feverish, and beats with more frequency; the Breath smells, and in great Worms the Pulse is Feverish.

The Pulse in Poisons from Opiates (such as Mandrake, *Altercus*, *Opium*) is made more full and rare, like the Pulse of the Lethargick, by 20 drops of *liquid Laudanum*, in a Fever the Pulse was reduc'd from 100 to 80 beats in a Minute, but next Day it rose again.

3. The Obstruction in the Artery alters the Pulse, so in a Polypus the Pulse intermits, and vibrates, and is obscure; the motion of the Body is slow and torpid, the Veins of the Neck are swell'd as big as two Fingers, the concretion of fizy Blood produces the Polypus.

Dr. *Harvey* observes, That the swell'd *Jugulars* alte & vehementer Pulsabant.

*Har-*

*Harvey* observes, That in an Aneurism in the Neck, *Pulsus ejusdem brachi exilis admodum.*

In the Varices *Lower* observes, That the Pulse is languid and deficient.

The old Obstructions produce unequal Pulses, being greater, and smaller, strong, and weak; and by these we know Obstructions, and Obstructions produce also intermitting Pulses: But at first Obstructions make the Pulse vehement, great, throbbing and frequent; after some time 'tis less, when the Obstruction inflames the Part, the Pulse is more frequent and hard.

A Schirrus makes the Pulse hard by hindring the passage of the Blood into the Veins.

All Obstructions in the hot *Cacochymias*, and in hot Constitutions, must be joined with a feverish Pulse; 'tis like a River stop'd in some of its Rivulets, the Water will run faster, and in greater quantity in the other Branches.

In the *Anasarca*, the Pulse is undose and soft; 'tis soft, because the Artery is empty, and the *Serum* is evacuated out of it into the solid Parts; 'tis undose, because the watry Blood moves slowly, being little rarify'd, and the Spirits much oppress'd.

The Pulse in the *Ascites* is small, because the Spirits are weak; and the Vessels have lost the *Serum* of the Blood by its Evacuation into the Cavity of the Abdomen; the Pulse is also quick, because the rarification of the Blood makes a feverish Crebrity, and there is a sort of hectic in all Dropsies, for want of *Serum* in the Blood; and this also makes the Pulse small, quick, and frequent.

The Pulse is subtense in the Dropsy, because the Artery is oppress'd by the quantity of Water, and the *Viscera* obstructed, pain'd, inflam'd.

In the Tympany, the *Arteria aorta* is not so much oppress'd, the Pulse is subtense, because a little oppress'd; the Pulse is also quick and frequent from the Evacuation of *Serum*, the Pulse is not weak, but very quick.

In the Tympany the *Serum* is extravasated betwixt the Muscles and Peritoneum.

In an *Erysipelas* the Pulse is quick and frequent, as in a Fever; and in a biliose *Cacochymia* 'tis great and vehement.

The Pulse in a Cancer is hard as in a Schirrus, and frequent as in an Atrabiliarian Constitution, or small Fever and Pains.



In a Gangrene an inflammatory Pulse preceeds, afterwards the Pulse is languid, small, and frequent, and a Sincope succeeds.

The Hemorrhoids may be observ'd by the quick and frequent Pulse when they are inflam'd; and by a small weak Pulse, if the Evacuations be excessive by Bleeding.

The Pulse is small and rare upon a Suffocation, or stop of Circulation.

The Pulse is frequent and unequal upon Dying.

The Inflammations and Pains in the Glands may be known by a quick and feverish Pulse; but in the old Obstructions, we can know no more than the Cacochymia which obstructs them, so it is in the Scrophula and Herpeset.

The inward Intemperies of the Liver and Spleen may be known by the Pulse of the several Cacochymias, and their great Obstructions by the hardness.

The motion of Humours is stop'd in their secretory Vessels, and the several Pulses are observ'd according to the Cacochymias.

The Jaundice without a Fever has a less, more frequent and hard Pulse, not weak, nor very quick, unless there be a small

small Fever; the Obstruction makes a hard Pulse, the stagnating Bile tinctures the Blood with a great Acrimony, which irritates the Heart; the Pulse is small, because the Spirits are oppress'd, and the Blood by a large quantity of Bile.

In the Obstruction of the Spleen the Pulse will be as in the melancholic Humour, and as in a Schirrus hard; if hot Winds obstructs the Pulse is as in the Atrabiliarians, if the crude melancholic Blood obstructs as in the cold melancholic Pulse.

In the Green-Sickness the Menses are suppress'd, which makes the Pulse quick and frequent; and the Pulse appears beating violently in the Neck.

Most suppressions of Humours naturally evacuated, ferment the Blood; and the stop of the Menses produce the *febris alba*.

Obstructions produce a diairy Fever if small, but if great a continent Fever; and there are signs of Putrifaction in the Pulse; the greater the Obstructions are, the greater is the Fever; after Bleeding the old Writers prescrib'd Detergents as Oxy-mels.

The binding of the Body heats it, and raises the Pulse, and causes Head-achs; but

but a natural Stool sinks the Pulse, and cools all the Body.

In the suppression of Urine the Pulse is oppress'd and frequent.

Perspiration stop'd makes the Pulse feverish, quick, and great; stiptic Baths as the Steel Baths stop Perspiration, and so do emplastic and stiptick Oils; and any thing which over dries the Skin, causes its Contraction, as hot Oils, Insolation, and much Wine, and little Motion, rousing in the Dust, vehement and dry Frictions.

The use of too much Niter or Salt in Friction, or too much Exercise.

If the hot acrid *fumose Perspirabile* be retain'd, it ferments the Humours too much; and glutinous, thick Humours are easily stop'd in their Perspiration; the Obstruction of the Pores breeds an Ephemera, or continent Fever, or an Intermittent.

I have transcrib'd these Observations about Perspiration from *Galen*; and the Causes of Perspiration stop'd must be avoided, but if it happen he usually restores it by tepid Baths, much Oils that is discussing, and by gentle soft Friction, moderate Exercise, warm, hot Diet.

In hot Countries, and hot Seasons, the greatest Evacuation is by the Pores, and  
we

we must avoid all Things which stop Perspiration, all Things which contract the Skin, as Horrors in Fevers, or Bathing, and all outward Stiptics. So *Galen* says, the *Albula* caus'd a Fever in a hot and dry Body; as Cares, Sadness, do the same.

The Pulse-Fits for Perspiration is the undose, which is a strong rare Pulse; and those Things which move the Blood to a quick, stop Perspiration; as Fevers, Anger, violent Exercise, hard Friction, great heat of the Sun.

4. The Pulse is alter'd by the Preternatural Evacuations of Humours.

In *Hemorrhagies* by the Nose, Womb, Disentery, Piles, if they be profuse, the Pulse is languid, slow, vermiculose if without a Fever; otherways 'tis small, quick and frequent, as in Fevers.

In the Flux of the *Menstrua* the Pulse is weak and frequent; and so it is in the *Fluor albus*.

In *Diarrheas*, *Disentery*, *Choleras*, which are generally joyn'd with Fevers, the Pulse is weak, small, quick, and frequent.

In a *Diabetes*, the Pulse is weak, quick, and hectical, and very frequent.

Vomit-

Vomiting and Nauseousness have a small, languid Pulse, a little quicker, and more frequent.

The Pulse in a Salivation is small and frequent.

In a *Diarrhea*, with Pains and Gripes from a Surfeit, the Pulse is Feverish.

The Pulse in taking of *Hellebor* is rare, languid, and slow, whilst they Vomit; 'tis unequal and inordinate also, but more ordinate as the Vomiting ceases, and less unequal than before: And when the Operation is over, and the Pulse returns to its natural State, 'tis equal, and greater than before, and more vehement; they who are convuls'd by the *Hellebor*, and have the Hiccup and faint, have a small, languid, inordinate, quick and more frequent Pulse; they who are suffocated by this, have a small, languid, inordinate, unequal Pulse; but not quick and frequent, but slow and undose, with a small Tension of the Artery.

*Note*, That strong Vomits raise the Pulse after the Evacuation is over, as is mention'd in *Hellebor*.

Lenient Purges sink the Pulse, but strong Purges raise it, as we find it makes us Feverish.

The vermicular Pulse is without a Fever, and it accompanies all great Evacuations, as *Hemorrhagies, Choleras, Diarrheas, Menstrual* and white *Flux*; but at last this ends in the formicant, which is extremely small, languid, frequent; this Pulse belongs to them who Die of these Fluxes, therefore the Pulse alters in all Fluxes; whilst the Fever accompanies Fluxes, the Pulse is Feverish; when the Spirits are low, the Pulse is vermicular; when extream weak, the Pulse is formicant.

5. The Diseases in the Animal Spirits alter the Pulse.

In Faintings or Sincopes, the Pulse is small and weak, and very frequent, which is call'd, *Pulsus Coacervatus*, in dying People: At last, in the Sincope the Pulse is rare, and then stops; the Pulse in the Sincope is not quick, tho' frequent; and not so frequent as in burning Fevers.

The Pulse in Giddiness appears small, unequal, intermitting, and the Stomach is Sick: In Giddiness with Fevers, the Pulse is Feverish, the irregular motion of the Spirits in the Brain hinders the Flux of Animal Spirits into the circulatory Organs, which produce a small and intermitting Pulse.

In the Palsy, in some the Pulse is languid, slow and rare, in others frequent and intermitting.

The motion of the Spirits is too much accelerated in Convulsions, and deprav'd by a windy *Serum*; and the Artery is describ'd as vibrated, or shaken like a Cord; and when 'tis shaken, in a Convulsion the annular Fibres may be constringed; so that the Artery may appear like a Cord when stretch'd at both ends; 'tis mov'd unequally, lift up, and retracted; and sometimes the Pulse appears vehement and great, but 'tis Convulsive in its Contraction and Vibration; but the *Strepitus* of the Pulse which is said to be felt, is unintelligible. In Convulsions the Contractions of the Muscles stops the Pulse.

*Galen* makes the Pulse of the Epileptic and Apoplectic alike; in a small Fit the Pulse is not much alter'd, in Vehemence, Magnitude, Celerity, Crebrity, and Hardness, if the Oppression be great thro' the stoppage of the Circulation in the Brain, the Pulse becomes unequal, tense, lesser, more languid, rare, slow; in extream danger through Compression, the Pulse is languid, small, frequent; the Convulsions in the Epilepsy will produce some convulsive

five

five Motions in the Artery, in the beginning of the Fit.

In Convulsions with a Fever I observ'd the Pulse quick and frequent, and intermitting in the Fits.

In *Hysterics*, the Pulse is small, weak, and rare; the Artery is convuls'd, and stretch'd out; by the convulsive motion in the Fits, in a dangerous Case the Pulse becomes frequent, inordinate and deficient; the weak Spirits use their utmost Effort to maintain the Circulation by a frequent Pulsation.

Sneezing, Oscitation, Pandiculation are convulsive Motions, and the Pulse is accelerated by them; we may observe the Pulse to beat faster after Sneezing, but that frequency will immediately cease.

The Pulse in a Palpitation is unequal, inordinate, sometimes small and slow, at other times frequent; the Pulse is continually irritated, if a Tumour be in the Heart, which causes it.

A Palpitation from a Fever is known by a great, quick, and frequent Pulse.

If the Palpitation be caus'd by expence of Spirits in Fasting, or Evacuations, or through Passions of Anger, Joy, Shame, Fear, the Pulse is quick and frequent; in Fear small, in Anger greater.

Water



Water in the *Pericardium* is thought to make a soft and small Pulse, and they have an Imagination that their Hearts are suffocated in Water.

If a Fume or Wind occasions a Palpitation, it goes and comes suddenly; but if any thing Corrupted, Venomous, Malignant, produces the Palpitation, there is a greater variety in the greatness and smallness of the Pulse.

In a *Hiccup* from Emptiness or Fevers, there is the Pulse of those Causes which produce it.

The Pulse in the *Catalepsi* is like that in the Lethargick in greatness, slowness, rarity, but the Pulse is not weak or soft; in the Lethargick the Muscles are relax'd; in the *Catalepsi* they are contracted, the Pulse is equal in the Catoche, unequal in the Lethargick; it seems to be a Convulsion with Sleep, and a mix'd Disease of both; the Artery feels hotter in this Disease, because the Blood is stop'd in it by the Contraction of the Muscles, which also makes the Pulse hard and small, and not weak. *Sennertus* observes, That the Pulse in the Catoche remain'd entire, without any Alteration great enough, and like the Lethargick.

In *Deliriums* the Pulse is disturb'd, contracted, or else appears to tremble and vibrate like a Cord. In Inflammations of the Head there is a Fever and *Delirium*, if the *Lympha nervosa* be wanting, they want Sleep; if too much, they have a Sleep, which is comatose. In natural Sleep the *Succus nutritious* oppresses the Head, in the Preternatural the fizy or watry *Serum*.

The Diseases of the Stomach alter the Pulse, if the Stomach be oppress'd with quantity of Meat, the Pulse is languid, small, slow and rare, the Spirits are oppress'd, and the Circulation thro' the *Cava* is retarded, and becomes slower, and the Blood is cool'd and clogg'd by much Chile; cool Meats produce the same Pulses.

The Inflammations and Pains of the Stomach have the Pulses of those Diseases, and so have the Tumors of it; the Pulse is hard, small and frequent.

Faintings, Hiccup, Nauseousness, Vomiting, have the same Pulses as those Diseases have, a small, languid, a little quicker and frequent Pulse; the Contraction of the Stomach in those Diseases accelerates the motion of the Blood in the *Vena Cava*, and that makes the Pulse more frequent; and the faintness of the Spirits  
will

will do the same. The Oppression of the Stomach by ill Humours makes the same Pulse, as the Oppression by an abundance of Meat

If the Humours be Phlegmatic, and not Hot, as in the *Baulimia*, the Pulse is languid, small, slow, rare.

After the Crebriety in long Diseases succeeds a vermicular Pulse in the Diseases of the Stomach; and those Diseases which have a rare Pulse, *Galen* says, have an odd appearance, as if the Artery were bor'd through, and divided; this I mention to try the feeling of the *Neoterics*, whether his Observation be Matter of Fact or only Fancy.

The Pulse is very small, if ceruginose Cholera only infects the Mouth of the Stomach.

If Asses Milk corrupts in the Stomach, the Pulse is small and unequal, as in all other Oppressions of it; but if it corrupts not, the Pulse becomes great and stronger, as it is after our ordinary Diet.

In cold and weak Digestions the Pulse is small and weak; therefore this is the Pulse in sour and windy Stomachs, who complain of them, and a Weight at their Stomachs.

In *Cachexies*, where the Chyle is not well digested, the Pulses are languid, weak and frequent; because the Spirits are weak thro' Crudity, and the frequency depends on weak Spirits, which cannot make a great Pulse to pass great quantity of Blood at one Stroke; and the Blood being but a little rarify'd, it Circulates with greater difficulty.

In the *Pica*, the Pulse is the same as in Nauseousness, the Spirits are anxious and languid, and there is sometimes a *Morsus* at the Stomach, and much Spitting; from all these Causes, the Pulse is small, languid, frequent.

Heat is the instrument of Digestion, and that is produc'd by a Fermentation in the Stomach; and the Pulse is greater or lesser, quicker, and more frequent, as the Heat of the Digestion is; for in choleric Tempers, where the Ferment is very acrid, the Pulse after Eating runs faster than in the phlegmatick Tempers, where the Ferment of the Stomach is more crude, sour, watry and slimy.

A nidorous *Ructus* has a hot Cause, a sour Acid, a want of Heat; therefore these may be known by the hot and cold Pulses; a nidorous Quality in our Stomachs produces an *Ephemera*, but an *Acerbity*,

*bity*, a coldness of Humours, and Pulses, weak, and slow, and rare.

A small, languid, frequent Pulse, accompanies a languid Stomach, Pain, Nauseousness.

As an Oppression gives a rare, slow, languid, small Pulse, so an Irritation gives a frequent, and more quick Pulse. When weakness and oppression both affect the Stomach, the Pulse is small, languid, frequent, unequal.

There are two Species of crude Humours in the Stomach and Blood; the Phlegmatic which is viscid, and the watry, in the Phlegmatic the Pulse is a little Tense, in the Watry more soft.

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## C H A P. VII.

*Concerning the Prognostications which  
may be made by the Pulse.*

**T**HE Prognostics in general respect the good and bad Event of the Disease, the time of the Event, and the Manner.

The Death or Health is to be observ'd by comparing the strength of the vital Faculty (which consists in a due Temper of the Fluids, and the strength of the Animal Spirits) with the Disease, its Kind, Greatness, Part affected, Motion, Manner, Symptoms in Number and Strength; and if the Faculty be stronger than the Disease, then Health will ensue; if weaker, Death; at that time the Disease Conquers.

An Imbecility may be in the solid Parts, as well as the Fluids; and the strength depends on both.

The vital Spirits are the Animal, as they are commonly call'd; I call them vital, because they move the Heart and

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Respiration; and they may be either oppress'd, or dissipated; and we judge of these as well as the Disorders of the Blood by the Pulse.

By the Numbers of the Pulse we know the greatness of the Disease, as the Numbers are distant from the Natural; and the Pulse it self is alter'd by the Disease in Celerity, Greatness, Frequency, Strength, &c. and the Disease is Dangerous as it injures the Circulation, which is known by the Pulse.

By a strong, great, quick Pulse, we observe the strength of the Spirits, by a weak, slow and rare Pulse, we discern the debility of Spirits, and want of a natural Rarification in the Blood; the vehement, great, quick, the undose, vibrating, and *Dicroti*, are signs of strength; but the small, languid, intermitting, slow Pulses; the *myuri*, *formicantes*, and *vermiculantes* are signs of a weakness.

If the Pulse be strong, 'tis a sign of a good and speedy *Crisis* in a Fever; if there be no signs of Digestion, and the Pulse be strong, 'tis a sign of a long, but safe Fever.

If the Heat be but little increas'd, it makes the Pulse greater; but if in a higher degree, 'tis also quick; but if most rarify'd,

rify'd, 'tis frequent; therefore by a frequent Pulse, if it be strong, we may observe the degrees of Rarification in our Humours, and the swiftness of the Circulation.

A frequent Pulse join'd with weakness, it is a sign of the utmost Efforts of Nature in dying Persons, as in the formicant Pulse; or else there is a Fever join'd with weakness of Spirits, as in the Consumptive.

A rare Pulse depends on weak Spirits, or cool Blood; rare Pulses are always dangerous, and so are small Pulses; if they be not by consent from other Parts, as the Womb, Spleen, Stomach; so in a *Boulimia* the Pulse is rare, slow, small, languid, and not dangerous; and the same is in histeric Fits, the beginning of Fevers, and Melancholics; a vermicular Pulse follows the profuse Evacuations of Humours, and shews the dissolution of Spirits.

A formicant Pulse attends the dissolution of Spirits in malignant Fevers, and 'tis the extream, quick, small, frequent, as the vermicular is the extream, slow Pulse, and both are commonly fatal.

In most Inflammations the Pulse is hard, and ferrine, except in the Peripneumonia and Lethargy.

A hard



A hard Pulse is a sign of the Inflammations of some nervous Membrane with much Pain, and 'tis a sign of fizy Blood.

A soft Pulse is from a cool Blood, or empty Vessels.

An intermitting Pulse is dangerous in Fevers, and a sign of Death.

Intermitting Pulses are most dangerous in young Men, not in the old, nor to those to whom 'tis natural; the longer the Intermission lasts, 'tis worse, and the more frequent it is; and if it be join'd with Languor, Crebrity, and Smalness, or else with Rarity, Languor, Slowness.

All unequal Pulses with strength and quickness, are more safe than those with Languor and Slowness.

An inequality in the Pulse is a sign of Irritation, Obstruction, Fulness, or Compression of the circulatory Organs, or animal Spirits.

An unequal Pulse which has any Order is seldom found, therefore inequality is generally joyn'd with Perturbation of Order; a small Cause produces unequal and ordinate Pulses, but a greater, unequal inordinate Pulses.

It requires great strength, and 'tis a sign of it, to keep the Pulse equal; 'tis unequal

equal in old Men, by debility of Spirits; and when they are oppress'd by the malignity of a Disease, or by violent Passions, great Evacuations, want of Nourishment, and great Pains, and always in Diseases of the Lungs, and Defluxions, Asthmas, Dropsies of the Breast.

An undose Pulse, if strong and high, is a sign of Sweat; if smaller, 'tis a sign of Weakness; 'tis common in *Anasarca*, *Quotidians*, Dropsies, and pituitous Diseases, or 'tis a sign of the oppression of the Brain in a Lethargy and Coma; generally an undose Pulse is a degree of slow Pulses from weak Spirits.

An undose Pulse with greatness is always a sign of Excretions from some Glands; an undose Pulse with hardness is from fulness; an undose Pulse with a Vibration is a sign of the *Menstrua*, or some *Hemorrhagies* by the Nose, Belly, *Hemorrhoids*, &c.

The weak, undose, ends in the vermicular, after great Evacuations.

A rare Pulse is sometimes join'd with a strong Pulse in those who live long, whose Bloods and Spirits are not too much rarify'd.

All Pulses which recede from their natural Mediocrity are ill, the languid, slow,  
rare,

rare, are worst, as well as the most soft and quick.

If a hot Temper fall into a hot Disease, the Pulse recedes but little from the natural, and a less quantity of cold Medicines will reduce the Pulse to its natural Number.

All Diseases are dangerous which affect the Brain, Liver, Lungs, Reins, Stomach, Heart, Veins, Arteries, because these Parts do promote the Circulation, or hinder it.

A very small, hard and frequent Pulse is fatal in Pleurifies.

Those Pulses are best which are like those of the Healthful, but it happens in malignant and pestilential Fevers, that as the Urine, so the Pulse is like that of the Healthful; but I doubt whether this Observation be true, for thus *Galen* describes the Pulse in the Plague.

In the beginning of the Plague the Pulse is little alter'd, but is like that in *Ephemera's*; but after the third Day the Pulse is evidently quicker and more languid, as the Heat increases; and the Breast feels hot, and the Breath stinks.

A full, or an empty, or soft Pulse, shews the great Rarification or Condensation of Humours, or their Plethora or Defect,

fect, the convulsive Pulse is fatal in Fevers.

A trembling Pulse is a sign of a Palpitation or great Weakness.

The *Dicrotus* shews the strength of Spirits, if vibrated; it also shews the oppression on the Organs of Circulation; and *Galen* makes it a sign of the Intemperies of the Heart.

A vibrating Pulse is a sign of strength, unless it ends in some unequal one.

Where the greatness of the Pulse can suffice, there is no need of Velocity; but as that remits, the Velocity is necessary; and if that does not suffice, Density is necessary.

A constant, strong Pulse, shews the Concoction of Humours, if it be also quick, and moderately frequent, and a constant, small Pulse; if it be also slow and rare, shews a weak Digestion.

A change to a great and high Pulse is a sign of a *Crisis*; a high, great Pulse, is a sign of an *Hemorrhage*; an undose Pulse foretels a *Crisis* by Sweat; a hard Pulse by Vomiting and Loosness.

We know the Concoction of Humours in a Fever, when the Pulse is great from small, strong from languid, equal from unequal, less, quick, and more rare.

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The Crudity of Humours is known by the abscess and length of the Disease; and the Pulse continues small, languid, quick, unequal.

There is a feverish Pulse attending all inward Abscesses, such as is in slow Fevers.

The *Systole* and *Diastole* more remiss in Celerity, are signs of a good *Crisis*, as well as of the Digestion of Humours, because a slower Pulse is fittest for Secretions; and a quick Pulse makes ill Secretions in Fevers; the great Pulse, and the slow, are always signs of good Secretions; the small and quick are the most unfit, and are signs of ill Secretions.

The alterations of the Pulse which depends on the *Non-Naturals*, as Diet, Exercise, Passions, do not last long; but a natural Pulse is most permanent.

When the Pulse changes from great, quick and frequent, to the contrary, it first becomes rare, then slow, afterwards small; and at last the slowness turns to frequency.

In Diseases of the Brain and Lungs the Pulse is soft, and tho' they be inflam'd not so hard as in other Membranes Parts inflam'd.

The Inflammations of the Muscles of the Belly, or other Muscles does not make a hard Pulse, unless the tendinous Parts are inflam'd; the Dropsie it self does not make hard Pulses, unless the Liver be inflam'd.

The Arteries near a Tumour are most hard, but if they be very remote, the Pulse is not alter'd; the Skins of the Testicles being inflam'd, make a hard Pulse; but if their Body be inflam'd, they are less hard.

The Pulse is made soft by a thin Blood, and in Dropsies, and Ordematous, Tumors, and by nutritive Diet, and Baths, and an idle voluptuous Life, and Sleep, and by Pituitous Diseases; all which relax the Habit of the Body, and make the resistance to the Pulse much less.

A hot Intemperies, a hot Cacochymia, Defluxions, Pains, Inflammations, and hot Tumors, make a feverish Pulse alike in all Parts; but in the cold Intemperies, cold Tumors, and moist Diseases, the Pulse is soft, slow, and rare; and this is chiefly produc'd by a pituitous and cold flatulent Humour.

A hard Pulse is from much Heat, when the Humours are viscid, and so they be in schirrose Tumors; and if it be from  
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a melancholic Humour the Pulse is more hard.

A great and high Pulse is a sign of a *Plethora*.

*Galen* tells us, That by the greatness of the Pulse in Health, we may know the Temperament of any Man; in thin Bodies 'tis greater, and in hot Constitutions.

*Galen*, in his Book of *Presages* by the Pulse, tells us, That by the Celerity of the Pulse we may know a hot Constitution; and by a slow Pulse, a cold Temperament; and they who have a quick Pulse generally have also a greater, both in Health and Diseases; and if the Heat be increas'd, the Pulse in hot Temperaments is very frequent; and very frequent Pulses shew more Heat than the quick or great.

The Pulse is most frequent and vehement in burning Fevers, where the Spirits are very much rarify'd; and the Blood is very acrid from Cholera, which irritates the Heart to a frequent Contraction.

The Spirits, Blood, or Respiration being stop'd, a Suffocation is produc'd.

Fevers, Consumptions, Evacuations, Pains, dissolve the Spirits, and kill.

If

If the great and vehement Pulses are more than the contrary, languid and small; the oppression in the Pulse is not dangerous.

Whatsoever Disease stops the Flux of Spirits to the Heart, or alters the Blood in its Quantity or Quality, or hinders the agitation of the circulatory Organs, is dangerous, because our Life consists in the Circulation, this happens in Dyspnæas Pains, Diseases of the Stomach, Liver, Head.

The Intermiffion of Pulses for one Stroke is most moderate; if for two Beats 'tis long, if for four or five 'tis dangerous.

Both very slow, and very quick Pulses are dangerous; and both subject to sudden Deaths, and so are very languid; therefore we must esteem all Extremities very dangerous, as the very rare, very weak, and very small Pulses.

The Crebrity is very great in burning Fevers, but not so pernicious; the most hard Pulse is also dangerous, as is the most soft, but the most vehement is not so, this is a certain Rule; the more the Pulse exceeds from the Natural, the more is the Danger.

A vehemency join'd with an undose Pulse is a sign of Sweat, because all Excretions



cretions require a slower motion of Humours, which helps the Secretion; an undose Pulse is a sign that there is no Schirrus, nor Inflammation, nor Convulsion, nor stoppage of Perspiration; because an undose Pulse is a Species of slow Pulses, and 'tis the excretory Pulse when vehement and high.

A Tendon in the Hands or Feet being inflam'd produces a hard Pulse, by giving a Convulsion to the Membranes, which stops the Pulse; the Inflammation of the Muscles does not make the Pulse so hard; but 'tis hard, because the Part is naturally hard; and is more distended by a Tumour, which makes the Pulse great, quick, frequent, because of the inflammatory Fever.

All Schirrus of the Liver, and Spleen make a hard Pulse, and in Dropsies Ascites the Liver is hard, which makes the Pulse so; and 'tis also mix'd by having something of Relaxation in the ends of the Artery, which makes the Pulse undose, and somewhat soft.

The Dropsy always follow the Schirrus of the Liver, and not always that of the Spleen; because the Tumour of the former breaks the Lymphatics which abound near the Liver.

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A Dropsy without an Inflammation of the *Viscera* does not make the Pulse hard.

The Evacuation of the *Hemorrhoids* and *Uterus* produce a Dropsy, by depressing of the Pulse to lower Numbers; and by abating the force of the Circulation.

The suppression of the *Hemorrhoids* and *Menstrua* fill the Vessels with serous Humours, which by a feverish Pulse are extravasated, and cause Dropsies.

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## C H A P. VIII.

Containing Directions for feeling the Pulse.

**T**HE first Direction I shall give, is, to consider the Pulse in its natural State, and the uses of it, which are to promote the Circulation of Humours, by which the *Crasis* and Fluidity of our Blood is preserv'd, as well as the mixture of its ferous and viscid Parts.

The Circulation also prepares and digests all the natural secretitious Humours, as the Choler, salt Serum, *Lympha lactea*, *succus Melancholicus*, and *succus Nervosus*, which all have several uses in the Animal Oeconomy; and the Circulation also expels all the excrementitious Humours by Sweat and Urine, and the hot Air by Expiration.

All these uses a natural and healthful Circulation performs; and they are well carry'd on, when we find the Pulse in its natural State; but a preternatural Circulation alters the Humours, in which the

Vigour of the Animal Spirits is alter'd, or the natural Temper of the Blood, which is sweetish like Chile; or the Organs of the Circulation are peternaturally affected, especially the Heart, Lungs, and Arteries. All these Changes we may know by the Pulse, and in feeling of the Pulse we must enquire what is the preternatural Temper of the Blood and Spirits, or circulatory Organs.

The second Direction I shall give, is, to find out the natural healthful Pulse in every Person; the Method I shall prescribe, is, to observe what number of Pulses every one has in his perfect Health; by observing the Morning-Pulses, before Eating, Exercise, or other external Accidents disturb it; and I will give my Observations on my own Pulse for an Example.

I find my Pulse in a Morning by setting down the Pulses, they will run in one Minute this Latitude from 66 to 86 in perfect Health; I therefore take the middle Number for my most moderate and healthful Pulse, which is 76; and that frequently happens in my best Health.

If we Fast till Dinner, the Pulse usually sinks to its natural Number, so mine came to 76, and by this Method all the  
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perspirable Vapors are spent; and when they are evaporated, my Pulse will fall from 90 Pulses over Night to 76 next Morning.

All Humours retain'd make the Blood Feverish, especially the Perspiration stopt; for the perspirable Vapors retain'd, are the chief Stimulators of the Pulse, and the chief causes of the Latitude every Pulse runs in a Morning: I compar'd the Pulse and the Morning Weight, *June 1st*, Morning Weight 164, Pulses 80, *June the 5th*, Morning Weight 162, Pulses 75 in a Minute, by which I found that the Pulses sunk with the Weight. But I have not fully experienc'd this Affair, neither is it easie to determine how far the Barometer and Thermometer alter the Pulse; because we often find the Pulse to alter, tho' the Thermometer and Barometer continue the same; the alterations which happen by the external Causes, as Air, Exercise, Baths, soon ceases; but the Pulses made great by Diet, or Wine, last longest.

It is requisite that every intelligent Patient should thus try his Pulse in a Morning in his Health, that he may inform his Physician what number of Pulses he has in a perfect Health, by which a Physician

may judge of his natural Constitution; and the Physician may know how far the diseas'd Pulse exceeds from the natural Numbers; and whether the Numbers of the Pulse are increas'd, or be deficient, by which he may discern whether 'tis a hot or a cold Disease; and whether a hot or cold Regimen and Medicines be most proper and agreeable; and all this the Patient himself may discern by the Pulse; and then he will intirely acquiesce in his Physician's Judgment and Method, when he hears that both correspond with the Pulse; and the Patient will have this farther Satisfaction, to try by his Pulse how the Medicine and Method alter his Pulse towards its natural State, by its returning to its natural Numbers; so if I be in a Fever, the Pulse will sink after one Ounce of the *Cortex* to 90 or 80, from 100 Pulses in a Minute, and after a second Ounce will return lower; and by this Method we shall know when we have taken a sufficient quantity of a Medicine.

By our Senses we must know the Nature of each Pulse; and by our Reason we may discern the Faults in the Humours which alter the Pulse.

We must first examine whether our Pulse runs too high, and exceeds the natural Numbers in a Minute; for then it over-digests and rarifies the Blood and Spirits, and makes the Secretions Bitter, Acrid, Salt, very Acid, and all the Evacuations of the secretious Humours are very violent.

When the Pulse runs too slow, the Blood and Spirits are too dense and cool, and crude; and all the Secretions are ill prepar'd, being either sweet slimy, *acerbe*, vitrious, or ferous; and all Evacuations of excretitious Humours are ill perform'd or obstructed.

All hot Diseases, as Fevers, Pains, Inflammations, and Hemorrhagies in the beginning; and Vapor-Fits from high Passions, inward Abscesses, *melancholia Hypochondriaca*, the Scurvy, Gout, Asthma, Stone, Obstructions, have a quicker Circulation than is natural.

These Diseases have a Circulation too slow, Dropsies, cold Catarrhs, Lypothymias, Varices, Polypus, too great Obesity, malignant Fevers, long Hemorrhagies, and all excessive Evacuations, Grief, Sickness at Stomach, Convulsion Fits; a weak Intermitting Pulse produces a Vertigo, Scotomia, and Lypothymia, and the Circulation is too slow; Sleepiness and

Heaviness of the Head are signs of a slow Circulation thro' the Head ; and Swelling in the Legs are signs of a slow Circulation thro' the Legs.

We know a languid Pulse when 'tis slow and rare, and small ; and in all such the Circulation is slow.

A great and a high Pulse is a sign of a *Plethora*.

We know an oppress'd Pulse when great and small; slow and rare Pulses, quick and frequent Pulses are mixt.

The Pulse is weaken'd by Fasting, Watching, Evacuations, Solitude, Sadness, Pains, especially in the Stone, and most by Vomiting, venereal Acts, violent Purges.

The Fevers usually run the Pulse to 100 in a Minute, yet we must consider that divers Constitutions which are of the cold Kind will make the Pulse to alter from that Number ; and sometimes a particular Symptom will alter the Pulse proper to any Disease. I observ'd that the Pulse run about 90 in an old Woman in her Fever, and if a Sopor be added to a Fever, it alters the Pulse, and makes the Beats slower, and so all Evacuations do.



The Pulse is most properly consider'd in its *Ictus*, which shews the Vigor of Spirits, and the *Intervallum* which shews the Heat of the Blood; a strong Pulse makes a strong Impression on the Fingers, and gives a great resistance to the Touch, and a weak Pulse resists little.

The Celerity of the Motion is discern'd by a quick Stroke, and sudden recess from our Touch; we know the frequency very well, but it requires a great Nicety of feeling to measure the Strength and Celerity in Diseases, which we must do by comparing them with the natural Strength and Celerity; and these want some Mechanical way to measure them, the frequency is well measur'd by the Minute Glass.

We must get a right Idea of a moderate Pulse as to Strength and Celerity, by often feeling of the Pulse of healthful People in a Morning Fasting; and the Pulse will appear most natural in the middle of the Spring, and Autumn.

Our Patient's Pulse must not be disturbed by Passions, Meat, Drink, Exercise, Sleep, Evacuations, different Seasons, and Changes of the Air: And we must also consider the Constitution, Sex, Age, the Climate, and time of the Year, because  
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a particular Number of Pulses belong to every of them ; and *Galen* directs in this, to get the Knowledge of a particular Constitution, by considering the Colour, Habit, Heat, Age, Temperament, Strength, Custom or Study, Manners, Sex and State, of the Air, Country, time of the Year. If we consider all these Circumstances, we ought to take a Quarter or Half an Hour to feel the Pulse of our Patient ; our Pulses are generally observed different in one Arm from the other, because of the Difference and Situation of the Artery, or one Hand is used more than the other, or because we lie in Bed more on one side ; but the most probable Reason is, because the Artery lies higher in one than in the other Arm, and proceeds more streight or more bending, and the Ramifications of the Arteries are different as well as the Veins in the Hands.

The Old Direction was to apply three Fingers to the Arms, or two, but I think one is more discerning, and less apt to impose on us, because the feeling with three Fingers may give us a false Notion of that we feel ; and since the Artery is now known to move in all parts at once, for at the same time the Heart constricts it self and strikes the Ribs, we discern  
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the Pulse in the Artery, as if a Solid Body were moved at one end, it moves in the same time at the other ; so it is in the Artery when 'tis filled with Blood ; and since we can touch but a small part of the Artery, we cannot discern the Celerity of the Motion of the Blood, as it passes from one part of the Artery to the other, but our Reason infers it from the Celerity of the Arteries impression on our Fingers. I generally feel my Artery by my Thumb, and the reason of prescribing many Fingers was the Opinion of the Arteries moving it self differently in different parts.

The Fingers may either compress the Artery much, or touch it lightly, or be apply'd in a moderate way, with a moderate compression, according as the strength of the Pulse is ; for a weak Pulse is stopt by a great compression.

The feeling of the Pulse in Fat People is very difficult, but it appears most evidently betwixt the Hand and Wrist.

In the feeling of the Pulse we must bend the Hand towards the Wrist, that the Artery may be a little relaxed, and better distended by each stroke ; and in weak Pulses we must turn the Wrist downwards, or in such Posture as the Artery may best approach to the Fingers freely.

I will

I will give the following Observation I made on my Pulse in *September* last.

The Morniug Pulse, Fasting, was 76, after rubbing with Brushes 86, and this did stand so sometime, but at last return'd to the Morning Pulse, which fell to a lower Number before Dinner : After Dinner the Pulses were 89, and before Supper 83.

Another Day the Pulse before Dinner was 77, and after Dinner it was 95. I Drank some Ale after Dinner, and two Dishes of Coffee after it, by both the Pulse was raised more than ordinarily it is after Eating.

The Night before an *Asthma*-Fit, I generally observe my Pulse about 90, and in the Fit, at least, 95, and sometimes more, that Number sometimes lasts two or three Days; and at other times when the Fit is short, the Pulse for two Days after the Fit stands at 85, or thereabouts. I give this Instance to shew how we may know our Diseases approach by the Number of the Pulses, and by the same we may discern the Degrees by which it goes off.

I observed the Pulse in the *Intermitting-Fever* to be 100; betwixt the Fit 85, after a Dose of *Laudanum* on the intermitting Day

Day 80, after an Ounce of the *Cortex*  
90.

The slower my Pulse beat, the better is my Breath, and if my Pulse be 90, I am always Purfive, but 95 makes me *Asthmatick*, I am of a Lean Habit ; but in the Fat *Asthmaticks* the Number of pulses will vary, yet in all Persons, every Fit of the *Asthma* is a Fit of the *Ephemera Fever*, as may be demonstrated by the frequency of the Pulse mentioned, which is 95 or 100 ; and if the Pulse comes to those Numbers by accidents of Diet, Exercise, Passion, it soon returns to its natural Numbers ; but whilst it continues so high I am Purfive.

Since the Pulse comes to its Natural Temper before Dinner, we may then observe its Natural Number, as well as in the Morning ; so I had observed the Pulse to fall from 86 in a Morning to 72 before Dinner. In feeling of the Pulse we may observe that it runs a Latitude of 20 Beats in its common variation, by Diet, Air, Exercise, Constitution, &c. The hot Tempers are apt to run from 75 to 90 in a Minute, or 95, without any great disorder, or settled Disease, but they soon sink again.

We can no other way so clearly distinguish the several Constitutions as by the Pulse, which discovers the Heat and Rarefaction of the Blood and Spirits, and the good or bad Secretions.

Choler is produc'd by a long Circulation, as well as a salt *Serum*; and there is but little of Choler and Saltness in Childrens Bloods; phlegmatic crude Chyle, and a crude *Serum* abounds in them, and a Sourness appears in their Stomachs; but Choler and acrid Salts, and a vitriolic Acidity abounds in the Humours of Adults, and in hot Tempers, who have exceeding Pulses; and these Tempers of Humours are the effects and signs of great Circulations.

In a biliose Cachochymia the Pulse is vehement and vibrating; and 'tis also great, quick, and frequent. In these the Comotions of Spirits are vehement, they are inclin'd to Anger, Venery, and Revenge; they are Couragious, of ready Wits, and Sharp, Bold, Boasting, fit for Business, and Careful; they dream of Fire, Tumult, Strife; all the motions of Body and Voice are quick, their Senses sharp, they soon grow old, they have thin Habits, Baldness, heats in the Hands, Hectics, Fevers, Phrensies, choleric Vomits, and Fluxes,  
Ery-

Erysipelas, Pustules in the Face ; they have an Appetite to cool Things, and are injur'd by hot. I have distinguish'd these choleric Tempers into 3 Degrees ; 1. The bitter Acrid ; 2. The bitter Salt ; 3. The bitter Acid ; and these have all the same Digestions and Qualities in divers Degrees.

The sanguine Tempers have a great and slow Pulse, and a full one ; in these their Imaginations are Gay and Pleasant, their Apprehensions and Senses good, but their Reasoning is dull, and their Memory weak ; they are of a serene Mind, Cheerful, Free-Talkers, of a profuse Laughter ; their Dreams are Pleasant, of Gardens, Musick, Weddings, great Persons ; they Sleep much, and are inclin'd to Venery, their Motions are moderate, they Eat and Drink much, use little Exercise, live without Care, they are subject to Hemorrhagies and Fevers, they are much reliev'd by Bleeding.

The cool pituitous Cacochymias are dull and slow in their Wits, and Sleepy, easily appeas'd in their Anger ; their Senses are dull, Motion slow, as well as their Voices ; they are Forgetful, dream of cold Waters, or Rain, or Snow, Drowning, Seas ; they are Slothful without Cares or Study,

Study, Sedentairy, Idle; Heat agrees with them, and not Cold, or Moist; the Old, Fat Men and Women are of these Tempers; they are slow to Venery, subject to Catarrhs, Dropsies, Cachexies, Whites, Coldness in the Hands and Feet; the Urine is Pale, much Phlegm, soft, smooth, cool Skins, white Complexions, the Habit Soft, Fleshy, Fat. I have made three Degrees of the pituitous Tempers, the sweet Slimy, the watry Slimy, and the slimy *Acerbe*.

I call the *Acerbe* Slimy the cold Melancholics, whose Motion is slow and grave, the Pulse also hard and slow; they Spit much, have little Thirst, acid *Ructus*, cold Winds, pale Water, cold and dry Skins; they have Fear and Sadness without Cause; they are difficultly provok'd, or appeas'd; they have a sad Aspect, obstructed Spleens, Varices, thick Blood, unequal Pulses, dull Senses, firm Memory, difficult Perception; they find Benefit by hot Diet, and Injury by Acids, and the Cold; they are very Solicitous, Studious in Autumn, and the Age from forty to sixty this Constitution prevails most, their Face is Lead-colour'd.

In the hot Melancholics, or *Atrabilarians*, they want Sleep, are Furious, full of Cares,



Cares, Frightful, Inconstant, of a horrid Aspect; they are subject to Fhrensies, Convulsions, Hysteric and Hypochondriac Fits, Epilepsies, *Incubus vertigo*, hot Winds, inflations of the Stomach, convulsive Pains, Quartans, Scab, Elephantiasis, Hemorrhoids, Vomiting and Purg- ing of black Humours; they are inclin'd to Venery, they have disturb'd Dreams of Sepulchers, Divils, Fighting, Murders, their Pulses are very frequent and hard, and unequal. I have counted 90 and more Beats in such Tempers, the Habit is thin, and Flesh hot and dry, and Hairy.

In the salt Cacochymia the Blood is salt and putrid, and they are subject to the Scurvy, Ulcers, Herpes, Pains, itching in the Skin, Lassitude, salt Rheumes, Stran- gury, Stone, Gout, falling of the Teeth and Hair, putrid Gums, leprose Scuffs, scorbutic Spots in the Skin, ceruginose Vo- mits, Lascivious; their Skins are hot and dry, and their Habit thin.

We find out the hot Cacochymias thus, I place the *Atrabilarian* from 90 to 85; the salt Constitution from 85 to 80, the Choleric from 80 to 75, the Sanguine and Temperate stands betwixt 75 and 70.

The cold Constitutions I place at these Numbers, the Phlegmatic or sweet Slimy

betwixt 70 and 65, the watry Slimy betwixt 65 and 60, the *acerbe* vitrious Slimy betwixt 60 and 55.

We may Prognosticate from these Numbers of the Pulse what the Passions, Wit, Constitutions, and Diseases any Person has, or is inclinable to: *Galen* observes in his Comment on *Hippocrates's* Book of Humours, that Understanding and Knowledge are appropriated to the choleric Tempers, Phlegm is contrary to them, Pleasures are delighted in most by the Sanguine, and Continnence and Study are most observable in the Melancholic; the Change of the Humours changes the Actions of the Mind, and the Passions of the Mind evidently change the Humours; a little adustion of the Humours makes Men Cautious, Prudent, Cunning, Constant, Ingenuous; but a great Heat makes them Atrabiliarious and Furious.

*Note,* That in all natural States of the secreted Humours the Pulse runs near the beginning of the Latitude of its Numbers, so in the cold Melancholy I place that from 65 to 60; but if that becomes vitrious and very *acerbe*, I must place it at 60, and probably lower; so in the phlegmatic Tempers, when the healthy

State

State remains, the Pulse runs near 70; but if the phlegmatic Cacochymia be great, and produces Cachexies, the Pulse runs towards 60, so it is in the choleric and salt Secretions; in natural Constitutions, the Pulse runs in the beginning of the Numbers assign'd to each Constitution; but as they are vitiated in those Cacochymias, the Pulse runs higher, as in the cold Cacochymias, the Pulse always runs lower; and this is the difference betwixt a natural Constitution which depends on a secreted Humour, which abounds more than the rest of the secreted Humours; but if that Humour be deprav'd by a higher Digestion, it runs the Pulse higher; if deprav'd by a slow Circulation, it runs the Pulse much lower; therefore before we judge of any Cacochymia, we must consider the natural Temper made by the prevailing secreted Humour, which gives the Denomination to each natural Constitution; and the Cacochymia is some depravation of the natural Humour either by a faster or slower Circulation.

The Diseases of the Lungs, as Inflammations, Schirrous, Intemperies, Defluxions by their Vicinity to the Heart, alters its Contraction by heating of it, or

obstructing the Motion of its Blood from the Right Ventricle, or by imparting some Sanious Ferment to it. All De-fluxions make unequal Pulses; the subtil Matter less, but the thick and viscid, oppresses the Lungs more; and every Disease of the Lungs alters the Reflux of the Blood, and consequently the Pulse alters its frequency; a rare, slow and small Respiration, make the Pulse so too.

The Liver communicates with the Heart by the *Vena Cava*, and its Intemperies affect the Pulse by heating of the Blood, or infecting its Mass with Cholera, Orpus, or obstructing the Motion by Compression.

The Stomach communicates with the Heart, by its Nerves and Veins; so that the Pains, Inflammations, Tumors and great Quantity of Meats, or Ill Humours, affect and alter the Pulse.

The Brain communicates with the Heart, by the Nerves and Jugulars, Lymphaticks and Membranes, and its Inflammations, Tumors, Convulsions and Oppressions, alter the Pulse; the *Viscera Schirrose* make the Pulse harder than when Inflamed.

The Habit of the Body communicates with the Heart, by Nerves, in Pains, Convulsions, by the Blood Vessels, in Tumors ; so Inflammations and Schirrous make the Pulse hard, ferous Tumors, soft ; those Parts which are nearest to the Heart and the great Vessels, alter the Pulse most ; those which are remote and near small Vessels, least.

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# PART II.

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## CHAP. I.

*Containing a New Mechanical Method, for  
preserving the Health, and prolonging our  
Lives.*

**W**HEN we have observed what Pulse is most Moderate and Natural in our Climate, which I find to be betwixt 70 and 75 in a Minute, in a Morning; we must farther Inquire, what is the particular number of Pulses, most frequently happening in our best Healthful State; and then we must endeavour to preserve our Pulses in as near numbers as can be to the Healthful Pulse in our Climate, and so to regulate our Pulses as to reduce it to those numbers in

which we find the most exact Health in our particular Constitution; and we must endeavour to preserve the natural Strength Greatness, Celerity and Crebrity; for by them we discern the natural Vigour of Spirits, a right *Crisis* of Blood, and a due performance of all Secretions.

The nearer our particular Pulses come to the number of Pulses proper to our Climate, the more Healthful our Constitutions are; and our chief Care must be to use such Air, Diet, Exercise, &c. which may keep our Pulses in such numbers as are suitable to our Climate, and to our particular Constitution.

Our Air is more inclined to Cold than Heat, therefore our Pulses incline to a greater Variety and Vigour than their's, who live under the 45 Degree of Latitude from the *Equator*; the cold Air, cold Liquors and cold Bathing, will help to preserve the Spirits, Humours and Pulse, in the natural State.

The natural Heat is increased by the closing of the Pores in the *Northern* People, tho' the External Cold will depress and weaken the natural Heat, where 'tis extream in the most *Northern* Climates, and there a Diet of Flesh is necessary to support the natural Heat, and to oppose the ex-  
tream



tream Cold; but a moderate Degree of Cold gives a great Vigour to the Spirits, and makes the Pulse more Vehement, Great and Strong.

We must support our decaying Circulation by Exercise, Friction, tepid Baths, warm Diet, and hot taſts in our Diet and Medicines; we must Walk or Ride before Dinner for an Hour or two, and we must stop all unnatural Excretions, Sleep little, and be angry, full of Cares.

The Circulation, if it runs too quick, will require cool Air, cool Diet, cold Bath, Sleep, Paſſions of Fear, Reſt, and all Excretions by Sweat and Urine, must be promoted in the natural Quantities, by which the Blood will be kept cool. We may Sleep Nine Hours, for after Sleep the Pulse ſinks its numbers.

The Paſſions of the *Northern* People are violent, as Anger, Revenge, Pride, Boldneſs; the Regulation of theſe will keep the Pulse in its due numbers, for Anger, and all hot Paſſions, cauſe the Pulse to exceed.

This is a certain Rule, Emptineſs by miſſing a Supper or Breakfast, and a perfect Perſpiration being over, (as it happens by Fasting till Dinner, the Pulse ſinks) and on the contrary, Fulneſs of Meat in the Stomach and Chyle in the Veins,

Veins, or other Secretitious Humours retained, always raise the Pulse.

I will here give my Notions, how we may use the Pulse-Watch for the Prolongation of our Lives.

Our Life consists in the Circulation of our natural Humours and Blood, and in the Expulsion of all Excrementitious Humours; when this is well performed, we may discern by our Pulse-Watch, which shews us when the Pulse is perfectly Healthful, or how far it exceeds, or is deficient in its natural numbers.

Whatsoever preserves the Circulation of our Blood, and the Vigorous Motion of it, that is a proper means for preserving of our Lives.

Whatsoever preserves the immediate Causes of the Circulation, preserves the Circulation. The Causes are,

1. A brisk Vigour, and good State of Animal Spirits.

2. A due innate Heat or Rarification of the Blood.

3. A right Disposition in the Circulating Vessels; and especially a right Inspiration and Expiration, which cause the Reflex of the Blood to the Heart, thro' the

the *Vena Cava*, after the Pulse has forced it thro' the Artery ; and there must be a right Disposition in the *Glands* to receive the Secretitious Humours.

From the former Reflexion, I have Collected these Intentions for the Prolongation of Life.

1. We ought to preserve the Vigour of the Animal Spirits, to contract the Heart with due Force.

2. We must preserve the natural Rarification and *Crasis* in the Blood, which moderately irritates the Heart to a Vigorous Contraction.

3. We must help the natural Secretions, and expel the Excrementitious.

4. We must renew the Decay of the Solid Parts, and of the Fluid, and expel the decayed Nutriment.

1. We must preserve the Vigour of the Spirits. The Lord *Verulam* describes the Animal Spirits to be of a middle Nature, betwixt Flame and Air, and that they are made of the florid Parts of the Blood ; the *Microscopes* have discover'd that the Blood consists of *Globuli* and the *Vacuum*. *Boyleianum* discovers that the Air is continued in them, which agrees with the a-fore-

foresaid Opinion ; to the Air our Spirits owe their Elasticity, and Sympathy with the External Air ; and we can add little to this Old Notion, but that these *Globuli* make a *Succus Nervosus*, when they have passed the *Glands* of the Brain.

Our Spirits must be Vigorous, but neither too hot, eager, nor too languid and cool ; the Spirits must be somewhat condensed, not too rare, in quantity sufficient, in Motion not over Agitated or Stupid.

1. These things raise the Vigour of the Spirits if too little Rarified or Crude, condensed or deficient, grateful Odors, and the strong Fetid, as *Volatile Salts*, *Volatile Acrid*, *Plants*, *Acrid Fetid Gums*, *Coffee*, *Musick*, *Friction* of all the Body, but especially the Head, Wine, and all Fermented Liquors ; Love and all Heroic Passions, great Designs, Cheerfulness and Hope prolong Life ; but Admiration and Contemplation agitate the Spirits as well as Cares and Study ; but if they be Excessive, they shorten Life. Serene cold Air strengthens the Spirits, and in great Frosts our Spirits are lively. A warm Air also raises the Spirits and rarifies them.

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2. These things condense the Spirits: Cold Air, Niter, which tastes cold, cold Baths, washing the Head with cold Water, Opiates, which stop the great Agitation of Spirits, and the Pulse, and these must be used most in *Summer*; use one part of Niter with ten of Salt, with all our Meats, or ten Grains of Niter in our Broths or Water, all sorts of cooling slimy Plants, Borrage, Buglosse, Lettice, Cichory, all Acid Fruits and Cucumbers, Melons, Pompions, which are Sweet, but Crude, Slimy, Watery.

3. These Things abate the exceeding quantity of Spirits, spare Diet, drinking Water, a hard Bed, abstinence from Fire, a Diet of Herbs, Fruits, Fish, Salt Flesh, Hair Shirts, frequent Fasts, and Watching, Fear, few Sensual Pleasures, much Venerly, and all great Evacuations by Bleeding, Exercise, Bathing, Vomiting, and Purging, Great Passions, Labours, Study: Hot Baths Cure Pains, Malignant and long Fevers spend the Spirits, all these are necessary for Furious and Turgid Spirits, but must be avoided by weak Spirits.

4. These things supply a defect of Spirits, as the Body is Nourished by a Diet of sweet Tastes; so the Spirits are by Aromatics

matics, we must use the Nutritive Diet, Eggs, Wine, Flesh, Spices, Chocolat, Milk to supply the Spirits, and we must excite and please them, by a gentle Agitation, by Musick; all Aromatics have an agreeable pungent Odor pleasing to the Spirits, such are Saffron Ambergrice, Musk, Cinnamon, Ginger, Nutmegs, Cloves, Candid Ginger, Nutmegs Candid. All these may be mixed into an Electuary, with Syrup of Cloves, and add as many Leaves of Gold as there are Ounces of Electuary.

The Cordials may be Stypticks as well as Aromatic, as sign Alloes, Saunders, Amber, Citron, Red Roses, Myrtle.

The hottest Aromatics in Diet, are Cloves, Ginger, Cardamons, Nutmegs; and these may be infus'd in Vinegar with Garlick for Sauces.

Ambergreece is of a moderate heat inwardly, and outwardly Crucus and Castor, more powerfully excite the Spirits.

*Galen* observes, that the Spirits are Nourished by Air as well as Odors, if it be subtil, pure cool, lucid, free from Fogs, Rain, Snow, avoid Moist and Fætid Habitations, or where the Air is moved violently or not at all, and where there  
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are great Heats and Colds, all Dungen places and standing Waters and putrid Countries.

*Ficinus* advises thus, *Utantur igne tamquam Medicina*, that is, to warm us when Cold, and to excite the Natural Heat. And he prescribes the following Elect. to preserve the Wit, Memory, Senses, it also helps Digestion and Secretions, and the Circulation of Humours. Take Thus: Two Ounces, Myrrh, One Ounce Leaf Gold, half a Dram; make it into Pills with any Syrup; but I would rather make them into an Electuary with Honey, add One Pound, Saffron, One Dram of Nutmegs, Two Drams of *Venice Treacle*, has a like effect; take it at Night.

Hot Air perspires too much, and against them cold Baths and Oyls are prescribed; or Wine with Myrtles and Roses, and Rosin, have been used for an External Lotion.

In hot Air, all Men use more Liquids, and in the cold, more Solids of Flesh, and more Fermented Liquors.

5. The Irregular Motion of the Spirits, are stopt by Sleep, Rest, composing the Affections, Drinking cold Water at Night, by the frequent use of cold Baths, and by the use of Opiates; Shame contracts the  
Spirits

Spirits as well as Sadness; Joy quiets all the disturbances of Grief, the Spirits are delighted with Novelties and Change, Ease, Reading, Conversation, Building, Painting, Experimental Philosophy, and these are proper Entertainments for Old Men, who are often pleased with the Company of Young Men and their Sports, according to the Remark of *Ficinus*, *Difficillimum est rejuvenescere corpore nisi prius ingenio repuerescas*. Tranquility of Mind, and Cheerfulness, are signs of a good Temper of Spirit, and we keep them in that State by restraining the Affections, by a Temperate Diet, Moderate Labour, avoiding Veneries, and all extraordinary Evacuations. Avoid all these things, which make the Spirits Turbulent, as much Study, Cares, violent Passions, Fasting, Veneries, great Projects, great Exercise, changes of Weather, Fevers, strong Smells. It is not the Depredation of Air on our Bodies; but the alteration of our Spirits by it, which injures our Healths.

We know all these disorders of Spirits by our Pulse-Watches, and by feeling of the Pulse, we know the great Rarification of our Spirits, and their exceeding Quantity by a great and vehement Pulse, and the condensation or deficiency of Spi-  
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rits by a weak and small Pulse, the heat and frequency, and degrees of Irregularity will appear by the numbers taken by the Pulse-Watch.

We must preserve a due Heat and Rarification, and sweetness in our Humours, by a Diet moderate as to Heat, and of a sweet Taste which will breed an Oily, sweet and viscid Nutriment; and mild, strong Spirits, the coolness of our Humours hinders their evaporation; and this must be procured by a cold Regimen, cool Air, cool Cloathing; many Cloaths spend the Spirits and Strength. All Aliments of a firm Texture, spend least, as Beef and Pork, salt Meats and Styptics, as Decoction of Oak or Vine-Branched, in our Bread, Coral, Pearl, in our course Bread. Water-drinking with a little Niter, Broths with Vine-buds, green Juice of Wheat, the use of Oyl feeds the Body, because 'tis roapy and sweet, and *Aristotle* has observed, *Ἐν τῷ ζῳῷ τὸ λιπαρὸν γλυκὺ*, the Blood must not be too fiery or salt, or viscid, or vitriolic, nor too Pituitous, *acerbe* or watry, or over-cooled.

'Tis no ill Advice to avoid all putrid Diet, and those which are apt to putrifie, as Fruits and Herbs, and to feed on those Creatures which live long, and are whol-

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some, to Eat no more than we can digest.

All thin Bodies must have a more cool and slimy Diet, and no hot Fermented Liquors; they may use much Oyl, Milk, Broths, and the most sweet and nutritive Diet; they must avoid too much Coition, great Exercise, Cares, Study and all great Evacuations of Nutritious Juices, by Urine, Sweat, Loosness; they must stop the Pores by Oyl of *Masticke* or *Quinces*, with cold Bathing; they must avoid Hunger, Watching, Anxiety, Labour, Anger, Pain, hot Air, hot Baths; for all these cause a deficiency in the quantity of our Humours.

All Fat Bodies are more cold, and want hot Diet, more Exercise, Study, and all the Regimen to keep up a natural Circulation, which is too slow in the Pale and Fat; they must avoid Sadness and Sloth, and all Satiety of Meat and Drinks, too much Sleep, all which stop the Circulation.

Old Men must avoid variety of Meats, and all great Quantities, great Labour and Venerie. Young Company preserves their Lives long, the use of Ever-Greens, as Pine, Lawrel, Olives, Bitter-Almonds, and all the Kernel-tasts prevent Putri-  
faction

faction in our Humours, and help our Digestions.

The Bodies of Old Men are best Nourished by Milk, Broths, Eggs, small Ale, Honey-Drinks, Sugar agrees with them, and it preserves all Bodies from Putrifaction; use Pine-tops in Ale, and anoint outwardly with Oyl and Wine, to which the Old Writers added a little Turpentine. Old Men may suck the Milk of a Young Woman, which with natural Transfusion of Chyle, and more natural than the Blood of Young Children, as *Ficinus* advises. Good Broth, Bloody Gravies are very Nourishing, easie Motion will excite the natural Heat, as Walking and Gestation; by the Pulse-Watch, we find when the Blood runs too fast or too slow; and by the same we may find the effects of each Diet, Exercise, Passions and Air; and by the number of Pulses we know when we must use a hot or a cool Diet, and what Method for preservation of Health.

3 The Secretions are preserved by the same means as preserved the Circulation, and also by those Medicines which have the same taste as the secreted Humours, the Stomach must be kept clean by Aloetic Purgers, by bitter Things, and warm Drinks are commended; and the Lord

*Verulam* discommended cold Liquors in a Morning, as Whey, Barly-Water; cold Juices, keep the Stomach externally Warm, by a Bag of Scarlet Wool, Myrtles, Citron Pills, Saffron dipt in Red Wine; the Body must be kept neither too Loose nor too Bound.

In *England* our cold Air hinders Perspiration, but promotes Urine; therefore by *Diuretics* we must preserve our Health, more than by *Diaphoretics*, the acrid Plants are the best *Diuretics*, as Scurvy-Grass, Mustard seed, or the Juice of Water-Cresses, Turnep-seed in Ale, with Broom and Antimony, of each One Pound in Six Gallons, this is the *Gout Ale*. Use Steel Drops towards Spring and Fall, to prevent Obstructions of the Secretions, and quench Gold or Steel in all our Liquors.

The Heart is preserved by the same means as preserves the Circulation; as the frequency of the Pulse sinks, so we find some Secretion increases; and as the number of Pulses rise, so we find some Secretion obstructed.

The Brain is preserved by the same means as alter the Spirits.

We know the Temper of the Blood and Spirits by the Pulse; therefore we must consult, that in the preserving the Heart  
and

and Brain, and by that we may discern the Intemperies, and other Diseases of those parts.

4. The Secretion of Excrementitious Humours must be helped; so the Phlegm and Choler may be Purged off once in 14 Days, by Aloetics, in decaying Constitutions, such are those called *Scotch Pills*; thus I make them. Dissolve One Ounce of *Aloes* in Elder-flower-water, Four Ounces evaporates to the consistence of Pills, add *Cremero Tartari*, Juice of Liquorish, and Two Drams, with Oyl of Almonds, make Pills. These may be taken Two or Three at Night, to stimulate the Peristaltic Motion in Old Men, in whom it is decayed, and moves slowly; and 'tis useful to the Infirm and Asthmatic, and Hypochondriac. The Urine is best promoted by Mustard-seed, One Pound in Four Gallons of Ale. We may promote Sweat, any Night, by *Tea* and Spirit of *Sal Armoniac* 30 drops in it. Friction and Exercise help all Secretions, and so do Tepid Baths, which they do by promoting the Circulation; the Skin must be kept clean by Wash-Balls, the Sweat, Urine and Stools, must be proportionable to the Diet; and when they are deficient, the Pulse rises in its num-

ber, but if they exceed their due proportion, the Pulse sinks, therefore by the Pulse we know the Excesses and Defects in the Secretion; and which Method we must use every Day, if the Pulse be exceeding, we must help the Excretions; if deficient, we must stop all Evacuations. Too much Secretion consumes the Body, and cools it too much; the want of Secretion of the Natural and Preternatural Humours, produces some Cacochymia, or a Putrifaction, if it occasions any great Ebullition of Humours; cold Baths stop all the Excesses in our Secretions.

5. The decay of the Solid and Fluid parts must be renewed, *viz.* The Dryness, Coldness, and Extenuation of the Habit of the Body, by Nourishing Diet, as by Milk, Sack, Broth, small Ale; and externally we must use Friction, then Unction, after that a tepid Bath for an Hour, then repeat the Unction, keep out of the Cold, use warm Drinks and full Diet, a Hair Shirt and Nettling attract Nutriment.

*Galen* in his Book of *Marcor* or *Marasmus*, imputes Old Age to the Driness or want of Nourishment in the Heart, which like other Muscles of the Body, becomes

comes extenuate thro' Age ; and he calls the Heart the principal part of the Body, and that Life depends on the Motion, and Death on the Cessation of it ; as the Muscles of the Heart decay, so does the Circulation and Life ; this is best repaired by Nourishment, Asses-Milk, Womens-Milk, Wine, tepid Baths.

There ought to be a different Nutriment of Old Men, according to their different Constitutions ; the Pulses of Old Men is small, because of the weakness of Spirits, and their Blood is little Rarified ; those Old Men who are naturally of a hot Constitution, or are Hectical, have a quick and a small Pulse ; but those of a cooler Temper, have a small and a rare Pulse ; for those with a quick Pulse, we must prescribe a cool Regimen, but for those with a slow and rare, the hot, Hony, warm Baths and Wine agree with these cold Tempers ; and Milk and Water-drinking, and cold Baths, with all the hot Tempers.

*Galen* commends tepid Baths for helping the distribution of our Meats, and curing all Extenuations, whether in hot or cold Tempers, for they can produce contrary Effects in causing Thirst, and Curing of it ; they cool those who are

heated by the Sun and Travel, by opening the Pores; they also heat those who are over-cooled by cold Air. Putrid Fevers are Cured after Coction by Baths, and so are Hectics; but if any Inflammation or Erysipelas attend a Hectic, we must first Cure that by Diet and Water-drinking before we use a tepid Bath; drinking cold Water is proper for divers Fevers, after the Third Day; and Bathing also. These tepid Baths will Cure all Driness from Venery; Cares, Anger, Watching, Fasting, Labour, Study, Solitude and hot Medicines, which things all Old Men ought to avoid; or Cure by these tepid Baths, or the cold ones, according to their different Constitutions; and Uction is very necessary, with their Bathing, for their dry Bodies, after Exercise, Friction, their Diet must in general be light; tepid Baths, Sleep and a soft Bed, nourish.

I observed in an Old Man that his Pulse before Dinner was 60; after Dinner it was 100; by which I discerned that he was Hectical, as most Old People are; and I observed the same Crebrity of pulse in an Old Woman of 70.

These



These following Observations I took at our Hospital, where I felt the Pulses of several Old Men in the Morning Fasting, in *May* last.

| <i>Ages.</i> | <i>Pulses.</i> | <i>Habit of Body.</i> |
|--------------|----------------|-----------------------|
| 91           | 71             | A thin spare Man      |
| 85           | 63             | A thin spare Man      |
| 84           | 81             | A thin Man.           |
| 83           | 84             | A thin Man            |
| 80           | 97             | A thin Man            |
| 78           | 78             | A little Plump        |
| 78           | 71             | A little Fat          |
| 75           | 70             | Of a Moderate Habit   |
| 72           | 78             | Of a Moderate Habit   |
| 69           | 77             | A little Fat          |
| 69           | 76             | Plump                 |
| 67           | 71             | Spare Man             |
| 62           | 71             | A little Plump.       |

The Pulse of those who live long is great and rare, and this must be preserved so ; the Pulse is generally too frequent in Children, which we ought to check by a cold Regimen ; and the same must be done in Old Age, where they are Hectical; and if the Pulse become slow and rare too much, we must accelerate it by a hot Regimen, for that is the best Regimen which restores the most healthful Pulse ; by the  
hot

hot Regimen we raise our Pulses, help our Digestion, and promote all Secretions, and we check the high Fermentations and Evacuations of Humours by the cold Regimen; thus by the feeling of the Pulse we discern all the irregularity of the Circulation, Digestion of Humours, and their Secretion; and by the Pulse we find by what Method we must regulate all Exorbitances; which makes me to assert that by the help of the Pulse-Watch, we may preserve our Health, and prolong our Lives.

The Old Writers have given many good Precepts about this Subject, and these may be Read in *Ficinus*, Lord *Verulam*; and *Aristotle* first mentions the Design of prolonging Life, but the Authors mention'd, wanted a Rule whereby they might know, when they must use their Prescriptions, and how much of them, and to what Constitutions; all which may be easily Learn'd by the Pulse-Watch, which will shew us when to accelerate or stop the Pulse by the help of the *Non-Naturals*. This is my Methodical Art of Diet, whereby I can raise the Pulse to its natural Numbers and Frequency, or abate the Vehemence, Celerity and Frequency.

I hope

I hope all Young Physicians will consider it, and so far improve this, as to preserve the Lives of my Country-men, who may also by the help of a Pulse-Watch, discern all those dangerous Exorbitances, which are caused by an Irregular Diet, Violent Passions, and a Slothful Life.

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## C H A P. II.

*Containing a New Mechanical Method for Curing of Diseases.*

**A**LL diseas'd Pulses either exceed, or are deficient in respect of the natural Pulse in Number, Greatness, and Strength, Celerity, Frequency.

If any Disease cause the Pulse to exceed the usual Number of Pulses in a Minute, 'tis a hot Disease, and requires a cooling Method; if the Pulse be deficient in Number, it requires a hot Method to raise and accelerate it.

All the hot Cacochymia, as the Bitter, Acrid, Salt, and vitriolic Acrid (or *Atrabilis*) are produc'd by an exceeding Pulse; and we must use a cool Method to Cure them by stopping of the Pulse, which still produces a new quantity of the cacochymical Humour; and we must Evacuate what is already accumulated, and alter the quality of Humours by a contrary Taste.

In all the Obstructions of the Glands and Vessels we must promote the Pulse; and excite a more vigorous Circulation; and help the Secretion by Simples of the same Taste, which will irritate the secretory Vessels as the secreted Humour does.

In all violent Motion of our Humours by exceeding Pulses, as in Fevers, Defluxions, and Pains, and Pthysis, we must stop the Pulse by the cold Regimen, and by the cool Tastes, and Bleeding.

In great Evacuations by Hemorrhagies and Loosness in the beginning, we must stop the feverish Pulse by the same Method as we Cure Fevers; but when Evacuations have continu'd too long, we find the Pulse too low; and then we must raise it by stopping of the Flux, and by that as well as the hot Regimen, we shall accelerate the Pulse.

The hard Pulse is from Obstruction in the Artery, and it requires the Method for evacuating the Cacochymia which occasions it, whether hot or cold; we evacuate it by Bleeding, and Purgings, and Sweating, till the Pain and Fever which accompanies Obstructions do cease; and then we must dilute the Viscidity of the Humours if it be sily, as in the hot Cacochymia by a cool Method; Bleeding is  
most

most proper for fourteen Days, with lenitive Purges; but in the declination Vomits, Mercurial Purges, and Sudorifics help off the remaining Viscidity; for after twenty one Days the Siziness is digested or putrified; and after all we must promote the Motion and Circulation to prevent all future Obstructions.

If Obstructions be from Pituita, Viscida, or the cold Cacochymia, that must be cur'd by Purging or Vomiting of that Cacochymia; and the slow Pulse must be rais'd by Steel, bitter Acrids, and volatile Salts.

The Celerity of the Pulse is a sign of hot Humours, and 'tis to be cur'd by a cold Regimen, and the Method for stopping of the Pulse; a slow Pulse must be cur'd by the Method for accelerating of the Pulse.

The frequency of the Pulse is stop'd by the same Method as the hot Cacochymia are cur'd; and the rarity of the Pulse requires the Method which accelerates the Pulse.

A vehement Pulse must be cur'd by a cool Method to stop it; and a languid Pulse must be cur'd by a Method which accelerates it.

If the Pulse be too full, as in *Plethorics*, we must use some general Evacuations, as Bleeding, and Purging, and much Friction; Exercise and Sweating to evacuate the quantity of Humours, and a sparing Diet; all which empties the Vessels, and sinks the distention of the Artery in a full Pulse; and the Rarification of Humours must be check'd, as in the hot *Cacochymia*.

If the Pulse be soft, the quantity of Humours is too small; then we must use a plentiful Diet, and stop all Evacuations, and raise the Pulse by the Method for accelerating of it.

If the soft Pulse depends on the Obstruction in the Lungs or Head, they must be cur'd by the same Method, as other Obstructions in the Vessels; if from Sickness, by the cold Regimen and cooler Methods; if from pituitous Humours, by the hot Regimen and hot Methods; in all Obstructions the Viscidity of Humours offends, and it indicates a diluting Method. We cannot know the sickness of Humours by the Pulse till it stops in the Artery in some Part, and then it produces a hard Pulse.

Unequal Pulses must be cur'd by removing all the Causes which compress,  
con-

constringe, or obstruct the circulatory Vessels, or irritate the Heart, and Vessels, and Spirits; if the Pulses be too small, slow and rare, we must accelerate the Pulse; but if these Pulses exceed, *viz.* the great, vehement, quick, frequent, exceed the contrary in their being mix'd with them; then we must use the cool Method to reduce the Pulse to an equality; so the intermitting, deficient, undose, vermiculant Pulses require a hot Method; but in the *dicroti*, vibrating, intercurrent, we must use the Method for stopping the Pulse; the formicant and *myurus* must be cur'd, as weak Pulses and small.

If any disorder of Spirits happen from the *Non-Naturals*, we must use the contrary; so what Diseases, Heat, Labour, hot Diet, or hot Passions produce, the contrary will cure; and we know by the Numbers of the Pulse, whether it was a hot or cold Cause, or Effect on the Spirits or Blood, which produces the Distemper; and if such Cause continue long, it produces a putrid Fever, or some Caco-chymia; all which we know by the Pulse, and we either accelerate or stop it, as the Pulse indicates.



In Apoplexies, Palsies, and soporous Affections, the Spirits are oppress'd; and the Obstruction on the Brain, Glands, must be remov'd, as in the Cure of sify Blood, in all other Inflammations; but when the Inflammation is over, the Palsy requires a hot Method for removing the Relics of the Obstruction; and a cold Regimen must be also mix'd with the other, to drive the Humours into the circulating Vessels again, and to help the weak Tone of a Part; and thereby to prevent the return of the Disease.

The disorderly Motions of the Spirits in Passions, Convulsions, Watchings, *Deliria*, require a cool Method to Compose them, and to stop the violent Circulation of the Blood; but in old Diseases, as in Melancholics, the Blood becomes grumous thro' Stagnation, which is occasion'd by a convulsive Constriction on the Heart and circulatory Organs, as the Lungs and Arteries; and in this Case the Pulse must be accelerated.

We may prevent Diseases by the right use of the *Non-Naturals*, which preserve the Pulse in its healthful Numbers, and reduce it to its natural Number; when we observe that it declines by rising or falling too much towards any Preter-na-

tural Number, whereby we know any Cacochymia or Disease.

That is the most healthful Diet, Air, Exercise, Passions, Sleep, Excretions, which very little raise or depress the Pulse from its natural State; and if it exceeds, or is deficient, we must always Cure it by the contrary Regimen.

Then we know that a Person is well when the Pulse is reduc'd to its natural Temper; and we may know how far a Distemper is from its Cure, by observing in how many Numbers the Pulse either exceeds, or is deficient; and we know by the Pulse how long we must continue a Medicine, *viz.* till it returns to its natural Temper; and we may, during the Method, constantly discern whether the Medicine has a proper Effect or no, by accelerating or stopping of the Pulse; and by this mechanical Method we shall in time find out the due quantity of Alteratives of any particular Taste necessary; for as any Diet or Taste of Medicine alters the Humours, they will make a sensible Alteration in the Pulse, and reduce it to its natural Temper; tho' we cannot discern the manner how Medicines alter the Humours, yet the Pulse is a certain *Index*, and shews in what Degrees the Medicine

dicine

dicine operates by some particular Taste; and this Method renders the Effects of Medicines certain and sensible, as well as the Taste, in which is the chief Energy of a Medicine; and we shall not hereafter impute Cures to Chance, because we have found out particular Simples, whose Tastes we have found to produce a certain Effect, which is sensible to our Sense of Feeling, as the Quality of the Medicine is to that of Tasting.

We know by the Pulse what Cacochoymia abounds, and consequently what kind of Purges are proper; the Cholagogues, Melanogogues, Phlegmagogues, or Hydrogogues, which evacuate the four secretitious Humours; the quantity of the Evacuation we know by the greatness of the Disease, and by the Strength; both which we know by the Pulse, the Part affected shews whence the Evacuation must be made.

The number and nature of the Pulses shews us the vigour of the Strength, and the greatness of the Disease; and by respecting these two Things, *Hippocrates* directs us to Diet our Patients in Fevers; in the Vigour of the Fever we must use the most thin Diet; but if the Strength be weak, we Diet more plentifully in the

beginning of the Disease; and the Pulse shews the declination of the Fit, when 'tis most proper to feed; the Pulse shews the natural Temper, the recess from that is the Disease; and by the Pulse we find the dry and hot Constitutions which cannot bear Fasting; the Pulse shews the particular Disease, and what Diet is necessary; so in Diairies from Heat of the Sun, Exercise, Surfeits, Fasting, Watching, Passion, suppression of natural Excretions, the Pulse being near 100 shews the Disease; and the exceeding Pulse indicates a cool Regimen, as Water-Drinking, and cold Baths after Digestion, by Circulation, which is call'd the Coction of Humours.

The Pulse shews those Fevers which comes from great Fulness, Inflammation, or Obstruction; and that in these Fasting is necessary, or a thin Diet; for the more high and frequent the Pulse is, the hotter we are; and the more thin the Diet must be, and more cooling, and the Medicines must be more cool; and the slower and smaller, and more rare the Pulse is, the hotter the Diet and Medicines must be.

A sweet nutritive Diet alters the Pulse very little, if it be not fermented; and  
if

if thereby the Pulse be alter'd to more frequency, we use a cool Regimen; if to more rarity, a hot one. And we must always remove all external Causes which alter the Pulse.

The vigour of the Pulse shews the great strength of Spirits to bear much Bleeding, and great Purging, and they must be proportion'd to the strength; we know the greatness of a Disease by the excess or deficient Numbers of the Pulse; and we must proportion the quantity of Alteratives to the greatness of the Disease.

By comparing the strength and greatness of the Disease, we must judge of the Event of it; and since the Pulse discovers both, we cannot Prognosticate without it so well.

The animal and natural Faculties depend on the vital Faculties which causes the Circulations; if that be found, the rest are so to.

We are certain that any Diet or Medicine is of a hot or cold Nature, as it raises or falls the Pulse.

In hot Diseases, we generally cool and dilute, as in Fevers; but sometimes in them we give Wine and hot Medicines to support the languid Spirits, and help

Secretions by Sweat or Urine ; we know the beginning, increase, and declination in Fevers by the Pulse, and that shews the proper time for Diet and Medicines.

Where divers Diseases are mix'd, the Pulse shews which is the Original, but great Symptoms will something alter the Pulse ; so in a Fever with Loosness, the Pulse is quick and frequent as in Fevers, but 'tis small and weak by the Loosness ; the Pulse will demonstrate how much each Symptom urges, and then ought to be respected.

We know what Topicks are to be apply'd outwardly by the Pulse, if it be quick and frequent, the cool Topicks are most proper, and Narcotics ; if the Pulse be slow and rare, use Discutients, and hot Topics.

We know when Bleeding is proper by the Pulse when 'tis high, full, strong, quick, and very frequent.

We know that no Narcotics are proper in slow and rare Pulses, because they thicken the Humours, and stop the Motion ; and if they be frequently given, they breed Cachexies.

It is a true saying, That Nature performs the Cure in Diseases, and the Physician only assists her by his Medicines ;  
by

by Nature we may understand the Circulation in which the Life of an Animal consists, 'tis that which does all that Nature can do; and the Business of a Physician is to regulate the Circulation, and by his Remedies to keep it in due Vigour, and not suffer it to run too fast or too slow; for when the Circulation runs extremely fast, and the Strength becomes weak, the Patient dies with a formicant Pulse; when the Circulation runs extremely slow, then the Patient dies by a vermiculant Pulse.

'Tis the Physician's Business to prevent both Extreams, which stop the Pulse.

1. We help the Preparation of our Chyle by Digestives, which must be of the hot Tastes in rare and slow Pulses; but of some of the cold Tastes, when the Pulse is quick and frequent.

2. The vitious quality of Humours must be always alter'd by contrary Tastes; and their several Tastes are known by the Cachymia which depends on a Circulation too swift or too slow, and the Pulse is too frequent or rare.

3. The quantity of Humours is known by the Pulse, and in soft Pulses we must increase the quantity by a nutritive Diet

of sweet Tastes; but in full Pulses we must diminish the quantity of Humours by a Physical Diet of Bitter, Salt, Acrid, acid Tastes, and Bleeding and Purgings.

4. The motion of Humours is accelerated in frequent Pulses, and requires a cool Regimen; but in slow, rare Pulses the Circulation is too slow, and requires the hot Regimen; as in obstructions of the Nerves, as Palsy, or *Serum*, as in Dropsies, or Arteries stopt as in Polypus, Varices.

5. In hard Pulses the fizy Blood stops the Circulation, and then to alter its viscid Consistence we must cool and dilute it by cool and watry Tastes; the undose Pulse shews the thin Serosity or watry Consistence of Blood; and they must be inspissated by hot Tastes, because the Pulse is too slow in Cachexies; and when the Humours become fizy, the Pulse runs too frequent, except in the Part pain'd or obstructed.

6. The Secretions require an undose Pulse naturally, and if the Pulse runs too violent, and the Circulation be feverish, the natural Secretions fails; or if the Pulse be too weak and rare, the Secretion is deficient; in the first Case the cool Method will help the Secretions; in the last  
the



the hot Tastes are necessary, and the Pulse must be kept great and undose; in general we use Medicines of the same Taste, as the secreted Humours, to stimulate their Excretion; so Salts help the Excretion of the salt *Serum*; Bitters, that of the Choler thro' the Liver; Milk, the sweet lacteal Lympha thro' the conglomerate Glands; and the thick vitriolic Blood thro' the Spleen, by *vitriolum Martis*; all the violent Secretions must be cur'd in the beginning by checking the violent Motion or Ebullition of Humours, and by Stiptics and Opiates we must stop the Flux.

7. The natural Mixture and *Crasis* of Humours must be restor'd by checking the Ebullition and high Pulse by a cool Method; and we must evacuate all Ferments out of the Blood by Bleeding, Vomiting, Purging, Sweating; thus Fevers and Inflammations, and hot Catarrhs must be cur'd, and the Part on which a Defluxion falls must be strengthen'd.

8. The Fusion or Separation of the *Serum* from the viscid Parts of the Blood must be prevented by accelerating of the Pulse; and the Circulation by Steel and volatile Salts, and bitter Acrids; by these means we Cure all cold Catarrhs, and Dropsies,

In all Defluxions, the *Glands* are first affected, as the Brain, the *Glands* in the Mouth and Neck, and Lungs next the Stomach, and Intestines, and Spleen, or the sily *Serum* sticks in the Artery of the Habit of the Body.

9. In Curing of Tumors, we evacuate the quantity of the *Cacochymia* which produces it, and we must correct the quality by contrary Tastes; the fulness of the Pulse shews the quantity of Humours, and exceeding or deficient Pulses the quality; and the quality of the *Cacochymia* indicates the same Alterative Tastes, both as inward Medicines, and Topics outwardly.

10. All Pains are to be Cured by removing of the Cause, as Inflammations, Sily Serum, Blood, hot Winds in Convulsions, and falso Acids, or Vitriolic Humours; in Pains the Pulse is very quick and frequent, therefore we must use Narcotics, and a cool Regimen to temper sharp Humours and stop the Pulse; and the Topics must also be cool and Narcotics, for all hot Humours do condense or thicken thin sharp Humours; but when the Pulse becomes rare, the *Cacochymia* is cold, and the Humours Crude and Thick, and they require discutient  
and

and hot Topics, as hot Humours require cold Topics.

11. The Laxity of Fibres in the Habit of the Body, or *Viscera*, is restored by Exercise, Friction, and cold Baths in Styptic or Salt Waters.

12. The Circulatory Organs are inflamed by hot Tumors, or Pained, or Corroded or compressed, or constricted; and where the Pulse is quick and frequent; a cool Method is necessary; but if slow, as in Palsies, Sleepy Diseases, Dropsies, a warm Method is most suitable; the Respiration is also useful for the Reflux of Blood, and the Causes which alter it must be removed, whether they be in Air-Vessels, Blood-Vessels or Nerves, and Muscles serving to Respiration.

13. The Faults of the Animal Spirits must be corrected when preternatural and regulated by the same Tastes as cure the Motion, Quantity, Quality, Consistence, or Secretion of the Blood, because the Spirits are generated out of the Blood; and have the same Faults as the Caco-chymias both hot and cold; from a Choleric Caco-chymia are bred acrid hot Spirits; from a Phlegmatic, watry, slimy Lympha, which oppresses the Spirits.

Since

Since by the Pulse we know each Disease, and its Cacochymia, from thence we may take the Indications for Cure; and find out the Remedies by a contrary Taste to the Cacochymias. And, since by the Pulse we know the quantity of the Medicine, and the greatness of the Disease, and the strength of the Patient in bearing of it, I cannot but affirm, that we may establish our Practice on the *Ars-sphugmica*, which will be very certain, safe and easie; and we shall hereby avoid all Disputes about Notions in Practice, and depend wholly upon our feeling the Pulse for knowing of a Disease, and Sense of Tasting for the knowledge of the virtue of our Medicines. And tho' every Patient may by his Pulse know the Disease, and what Method must cure it; yet none but an experienc'd Physician can direct which of the Specific Tasts is most suitable to the Constitution; in what Dose it must be given, and in what Method we must use Evacuations, Alteratives and Topics, and how we must at the same time relieve all urgent Symptoms. I have, above, mention'd the *Galenick* Indications from the Humours and Cacochymias, and have endeavoured to adjust them to a swift or a slow Circulation and Pulse; which Method of Physic,

is both Mechanical and Philosophical ; tho' I believe the Mechanical is most easie and certain ; for in this Method 'tis not necessary to assert more of the Humours, then as they are moved, too fast, or too much rarified, or in too great quantity, or that the Humours are deficient, condensed, too slowly moved ; this is obvious and certain from the Pulse, and by Experience we know, that a hot or cold Regimen will cure them. Infinite are the Opinions of *Galenists* and *Chymists* about the Nature of every Disease, they agree as little in their Physiology and Explication of Humours ; there are as many different Hypothesis as Physicians, therefore no Practice can be certain, which depends on Notions or Hypotheses, or any of the Modern Philosophy, but in the Circulation we find both our Life and Death, and Diseases, which are several Irregularities which tend towards Dying, or stopping of the Circulation and Pulse.

C H A P.

## C H A P. III.

*Containing the Method for Curing of the Pulse, when it beats too high and fast, and exceeds its natural Number in a Minute.*

i. **W**E stop the Pulse by frequent cold Bathing, and we become more cool all the Day after. I observe immediately after the Immersion, the Pulse to beat Ten Pulses less in a Minute, and cold Epithemes on any part of the Body, will have a like effect as cold Baths; but in a lower Degree, as have also the Lotion of the Head, Feet and Hands, cold Air, cold Countries and cold Seasons, all these stop the Pulse and make it rarer, but they accidentally strengthen the Pulse, by stopping the Pores; and by detaining the hot Perspirable, the cold Epithemes are usually applied to the Heart, to the Pulses, Forehead, Testicles; all Liquors must be used cold, and the Cloaths must  
be

be cool and thin, the Head and Feet must be often washed ; and by these means the Rarification of the Blood and Spirits will be checked, and the Humours condensed : Dr. *Harvey*, in his *Exertatio Anatomica* the III. has this Observation, *Hoc sum expertus a Suffocationis Asthmatica, summo discrimine, cucurbitis affixis & multa subita aqua gelida affusa Liberatos fuisse non paucos.*

2. In Rest, the Respiration is less and rarer, and the Motion of the Muscles cease ; all which ordinarily promote the Reflux of Blood to the Heart, for these Reasons ; During Rest the Pulse beats more slow, and because in Sleep we rest long, that also makes the Pulse less frequent.

3. In Sleep the Pulse is more rare, because Respiration is less in Sleep, as well as Muscular Motions, both of which help the Reflux of Blood, and thereby promote the Circulation.

4. By cold Diet we stop the Pulse in its frequency ; so a Glass of fair Water in the Morning, and Fasting till Dinner, will sink some Pulses 20 Beats ; the qualities in our Diet, which stop the Pulse are its Serosity, or watry Tasts ; *Hydroposia*, Whey, Milk and Water, Toast and Water

ter for ordinary Drink, Steel Waters, Wood Drinks, Liquorish, Infusion instead of Fermented Drinks. All the acid and *acerbe* Tasts in our Diet, stops the Pulse, and all the Mucilaginous Tasts, as Borrage, Bugloss and the Styptics, as Sloes, Medlars, Quinces, stop the Celerity of the Pulse and Circulation externally; Unction with Oyl of Guinies or Omphacine.

5. The Passions of Fear and Sadness stop the pulse, and thereby make the Blood thick like a Jelly; they divert the Spirits from the Heart, or else constrict it too much, and thereby create the apprehension of Swooning, or Faintness and cold Sweats, which are the effects of a Pulse too weak and slow in the Vapors and Melancholic Persons, who also breath too slow and rarely, which hinders the Reflux of Blood.

6. All Evacuations of Humours cool the Blood, and stop the Pulse by abating the Ferment and Quantity of Humours; so Bleeding cools, and Purging moderately after Bleeding at the Nose, and after the Measles, and after Lying-In, I have observed the Pulse to be weak and rare, under 70; and we may observe, that after Sweating we are apt to be chill and  
very



very cool. *Galen* advises to use a tepid Bath, first to evacuate hot Fumes, and after a cold Bath to extinguish the Feverish Heat (τῷ ψυχρῷ σβέσσει τὸ καῦμα) then stop the Pores and Strengthen. He also in his Tenth Book of his *Methodus Medendi*, makes this curious Observation, That the Sweat which was excited by the tepid Bath, continues after they come out of the cold Bath, when that is used after the hot, which only prepares the Infirm for the cold; this Practice is very useful in Curing Diseases, where we are obliged to promote and stop the Pulse and Evacuation, as well as stop Fluxes.

The Medicines or Remedies whereby we abate the Pulse, are either Evacuati-  
ons or cool Alteratives, and Chirurgical  
or Dietetic Means.

1. The Evacuati-  
ons by plentiful Bleed-  
ing, for when the Veins are empty the  
Blood urges the right Auricle less, and  
the Circulation is less frequent, and the  
*Aorta* being more empty, the pressure by  
the injected Blood is less upon that which  
remained in the Artery.

2. Gentle Purgatives empty the Fer-  
menting Mass, which supplies new Chyle  
and Spirits, and thereby cools the Blood,  
and its Rarifications; Wines are cooled, by

being drawn off their Lees, and a great Quantity of *Serum* being Purged off the Vessels are less full, and the Circulation becomes more rare, for want of an irritating Quantity or Quality.

The Alteratives are the several cool Tastes which affect the Solids, as well as Fluid Parts of Animals.

1. The Styptics which contract the Stomach and all the Membranous Parts by which they hinder their Motion; and the same Tastes also condensate the Blood and *Serum*. Stypticks also straiten the Breath, and they thereby also hinder the Circulation; they also abate the Peristaltick Motion in the Guts, and thereby retard the distribution of the Chyle into the Blood, whose continual Flood into the Veins promotes the Reflux of the Blood to the Heart, as appears by Dr. *Needham's* Experiment, who blew into the Thoracic Duct, and thereby revived a Dead Animal. 'Tis not improbable but that Styptics act on the Membranes of the Arteries and Veins, in the Habit of the Body, and there straiten the small Canals in their passage thro' the Glands, because they stop all Fluxes thro' them; and Styptics also stop Hæmorrhagies by Constriction of the

the Vessels; and all Defluxions by Constriction of the Glandulous *Viscera*.

2. The Mucilages defend the Membranes by their Slime from any Acrimony, which irritates them, as they also temper the Acrimony and Rarification of Humours, and thereby abate the Irritation on the right Auricle of the Heart; the Mucilages relax the Tone of the Solids outwardly, and if they can relax the Circulatory Organs, that may hinder their natural Contraction, by which the Circulation is promoted.

3. Acids act as Styptics on the Membranes, and they more powerfully coagulate and condense the Fluids; they fix the Salts and Oyl of the Blood, and thereby cool much; the Acids are best taken in Water, as Spirit of Sulphur is.

4. The Serous or Watry Liquors relax the Solid Parts by their Humidity, and inwardly they dilute the Blood and Spirits, and the Crudity or want of Fermented Air in the Bullule of Water, makes the Water heavier than any Animal Humour; and when the Mass of Humours is mixed with it, they move more slowly, and the Rarification of Blood and Spirits is made less thereby.

Opiates, tho' hot in taste, have a cooling effect by stopping the Pulse, and all the Circulatory Organs in their natural Motion; Opiates produce a Delirium in the Spirits, by their *Volatile Salt* and *Venomous Fætor*, and thereby hinder the ordinary Flux into the Muscles of the Heart and Respiration, and also into the Muscular Fibres of the Stomach and Guts, and Limbs; whereby the Tone of all parts is relaxed, which usually help the Circulation.

6. The use of hot Baths, hot Cloaths, much Exercise, which produce much Sweat, and thereby discuss the Volatile Parts of the Blood, accidentally cools our Humours and Solid Parts, when in a hot Intemperies.

7. Quick-silver is observed to stop the Pulse, and quick Motion of Humours, because it produces Palsies and Stupors; and it also checks the Rarification and Putrification of the Humours, and Cures Quartans, as Authors affirm. All these Effects it produces by its Acerbity, which is evident in its Fumes; and by this Quality it coagulates Humours, as Sublimate does.

8. Fasting in a Morning reduces the Pulse to a slower Motion and Rarity, when

when it beats too fast ; all new Chyle causes a heat when it mixes with the Blood, which stimulates the Pulse ; and all Fasting, or missing of a Meal, hinders the fulness of Chyle and *Serum*.

9. All Immoderate Evacuations by Bleeding, makes the Temperament cold, and they change the Colour of the Face ; they alter the Habit of the Body, and they produce Dropsies, Orthopneas, Obstructions of the Liver, weakness of Stomach, Apoplexies, Palsies, all which are occasioned by a slow Circulation of Humours ; when we Bleed, *ad animi deliquium*, we must observe the Pulse.

10. By Ligatures, and Pericarpiums of the cool Tafts, as Styptics, Acids, Slimy crude Juices, we stop the return of the Venal Blood, and cool its Rarification in Agues. Cool Epithenes to the Heart, Temples, Stones, Pulsers, Feet, chill the hot Spirits in the Nerves, when too much Rarified ; and thereby they stop the violent Circulation in Fevers and Hemorrhagies. *Sanctorius* advises a Bladder of cold Water, or Snow, to the Stomach, in hot Pains, and a Sheet dipt in Vinegar, may be applied to the whole Body ; in Hemorrhagies

we hold cold Iron, or Stones, in the Hands, and apply them to the Neck.

11. 'Tis observed, that the Tonic Motion of the Muscles, retards the Course of the Blood, because Varices are produced in the Legs by long standing, and if we stretch out our Arms, the Pulse will appear low and small, because the Arteries are compressed by the Tension of the Muscles; and the same Pulse appears in Convulsions by the compression of the Tense Muscles, 'tis only the alternate Motion of the Muscles, which promotes the Circulation. Long Thinking occasions our long standing fix'd in the same Posture, and these may be prescribed as a peculiar sort of Rest, to stop the Motion of the Artery, and to retard the quick Reflex thro' the Veins.

12. The Artery which carries a Flux to any part may be compressed, and thereby the Pain may be Cured, and the Artery will shrink by any sort of Burning, such as is made with Moxa, or hot Irons.

13. If a Ligature be made on any External Part, and the Blood in it be cooled by the affusion of cold Water, when the Ligature is loosed, the Blood will

return'd cool to the Heart, and 'tis apt to cause Fainting; but yet this Experiment may be tried in excessive Heats; and the washing the Head and Feet in the Morning, and the washing the Hands before and after Meats, according to our *Colledge Custom*, has a like effect; by cooling the Blood in the extremities of the Body, the whole Mass becomes more cool.

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P 4 C H A P

## C H A P. IV.

*Containing the Cure of the Pulse when it Beats too slow, and it is deficient in its natural Number of Pulses in a Minute.*

1. **E**XERCISE quickens the Pulse, and Walking more than Riding; Friction has the same effect, the contraction of the Muscles forces the Blood towards the Heart.
2. Hot Air, and hot Baths raise the Pulse, by Rarifying the Blood and Spirits; hot Cloaths and Flannels next the Skin, warming Beds, hot Fires, hot Ointments, and hot Perukes, and Snuff do the same.
3. All hot Diet raises the Pulses, as all Fermented Liquors and Flesh Meats, Brandy Spirits, all actually hot Liquors, as Tea, Coffee, but Chocolat raises the Pulse 10 Beats in a Minute; Coffee and Tea less; the Diet of Acrids, Aromatics, Bitters, Fetids and Putrid Things, and the Salt Diet very much heat the Blood; Old Wines,



Wines, and they which taste of Rosin, are hottest.

4. All the hot Passions of Anger, Joy, expand the Spirits, and give them a more vehement Motion; Study, Cares, very much heat the Spirits.

Watching heats by stopping the Perspiration, and a long agitation of the Spirits rarifies them.

6. Excretions retained, as Stools, Urine, Blood, Sweat, Semen, heat the Body and raise the Pulse; Bleeding moderate quantities by the Nose, Uterus, Anus, removes some Obstructions, abates the quantity which oppresses, and accidentally raises the Pulse.

The Remedies which raise the Pulse, are either the hot Alteratives, which either affect the Nervous Papillæ in the Stomach, or the Blood in its Reflux, or else they raise the Pulse by stopping Evacuations.

1. The Acrids, as Cresses, affect the Membranes of the Stomach as they do the Tongue, by their hot burning pungency, and they thereby rarify the Humour, when it reaches the Blood Vessels, the pungency stimulates the Membranes to a Contraction, by which the Circulation

tion is promoted, the pungency stimulates the Blood-Vessels; and the Secretous by which Obstructions are open'd, Acrids are in a low degree vesicatory, and they irritate the Pulse by Pain and their Volatile Salt.

2. Caustic Tastes irritate the Pulse most, when applied outwardly, and they must have the same effect within; so Garlick or the Scarabæi being applied outwardly raise a Fever; and if they be used inwardly, they inflame, heat and corrode the Solid Parts. So Squill Medicines inwardly irritate the Pulse by acting on the Membranes in the Stomach, and causing a constriction of them, by which the Blood is forced thro' the *Vena Porta* towards the Heart.

3. Aromatics heat by their agreeable Odor, and Oily Acrimony, which irritates the Pulse by stimulating the Nerves and Membranes in the Mouth of the Stomach, where Opiates and other Fetids have also their effects.

4. Sweet Things offend Hysterics and Hypochondriacs, by fermenting in their Stomachs; and for the same reason Honey is injurious to hot Constitutions, but agreeable to cold Stomachs.

5. All

5. All Bitters have a deturgent Quality, and do nauseate the Stomach and offend the Spirit in its Papillæ, and when the Spirits in the Nerves of the Stomach are irritated, by consent those of the Heart are affected and irritated; so we find all the Body trembles at the taste of a Nauseous Thing.

6. All Odoriferous Medicines act on the Nerves in the Mouth of the Stomach; such are Musk and Ambergrice, and Castor or Amber Fetids; and Camphir does the same, as well as Assa-Fœtida, Sulphur, Steel.

7. All Salts, Volatile and Lixivial, have a Burning Acrimony or Pungency, and an offensive Fetor, which stimulates the Membranes, and offends the Spirits by their Fetor, as Chymical Oyls do by their strong Fetor outwardly expand the Spirits, and irritate the Membranes when we apply them to the Nose; so when they are taken inwardly they have the same effect on the Nerves in the Stomach, which they vellicate and expand the Spirits, whereby the Circulation is promoted by those Smells and Tastes, acting on the Solids and Spirits, before their Virtues can arrive in the Blood.

8. All

8. All Nauseous Tastes stimulate the Mouth of the Stomach, and they create the same *Nausea* there as in the Mouth, they promote and stimulate the Peristaltic Motion of the Intestines, which will accelerate the Motion of the Chyle, and its distribution ; and the Chyle moving faster will hasten the Reflux of the Blood thro' the Axillary Veins to the Heart ; and the Blood is forced from the Guts to the *Porta* and *Vena Cava*, by the frequent contraction of the Guts, and this will produce a Feverishness after great Fluxes and Purges.

9. Vomits work most by exciting the Peristaltic Motion ; for by promoting that they move the Blood to a swifter Reflux thro' the *Cava*, which the Convulsive Motion of the Diaphragme and Stomach, very much help ; thus after strong Vomits the Pulse is accidentally raised.

10. Sneezing promotes the Motion of the Blood, and excites the Pulse ; for in a great Inspiration the Diaphragm is much depressed, and forces the return of the Blood thro' the *Vena Cava*.

Stretching and Yawning are natural Motions to help the Circulation when it becomes too slow.

Sneezing

Sneefing is effectual and useful when we take Snuff, but it acts only on the Spirits to irritate them, when Snuff does not make us Sneefe; and Sneefing clears the Lungs and Nofe, and quickens a flow Circulation; the common dry Snuff, dries the Mucus in the Nofe, but if we use Primrose Roots with Niter and Sugar-Candy, this will not clog the Nofe, but cause Sneefing and Blowing of the Nofe.

All Secretions, thro' other *Glands*, are promoted by some Acrimony in the Specifics. Hepatics are Bitter Acrids like the Bile, and stimulate the Secretary Vessels of the Liver, as Bile does; and they must act as Sneefing and Masticatories do, if they stimulate the ends of the Secretary Ductus of the Liver, or other *Glands*. In the Guts, all Vomits and Purges have a stimulating Acrimony and Sweaters; and Diuretics act by a stimulatory Acrimony; so the old Smegmata act, outwardly applied, and Cantharides also stimulates the Urinary passages.

II. All actual hot Liquors rarifies the Blood and Spirits, which are in the Nerves and Veins of the Stomach, by which the Circulation is promoted; so hot Tea, Broths, Drinks, first heat the Stomach,  
and

and then the whole Body ; and the first effect must be by promoting the Reflux of the Blood, and by Rarifying the Air in it, which will immediately drive the Pulse faster ; applying outwardly a Young Creature, helps the Circulation as well as hot Oyls, as *Ung-nardinum, Opobalsamum, Tobacco*, raises the Pulse much as actual heat does ; and we may use Salt, Bituminous, Sulphoreous, hot Baths, or tepid Baths, with Mustard-seed.

12. Blistering Plaisters raise the Pulse, and so do very hot Acrid Plaisters, or hot Aromatic Epithemes to the Pulses ; and Cupping-Glasses with fire to the Heart, which excite its Motion, as hot Water will do ; the Fire and Blisters insinuate hot Particles into the Blood, burning heats a part, and raises the Pulse as all things do which cause Pain.

13. Stopping the Pores by cold Baths accidentally heats, and so does the cold of the Winter, and cool Cloaths ; extream Cold extinguishes the heat, over-chills and breeds Trembling and Stupors.

14. All Evacuations must be stop'd which sink the Pulses.

These following Observations about the Pulse, I will here place as Additions to the former Treatise.

I observ'd, that the Pulse was rais'd by drinking *Buxton Waters* at *Lichfield*; I have us'd them as we use *Bath Waters* warm'd; I find they have the same Virtue in cleansing the Lungs in hectical Cases, as the *Bath Waters* have; but they are to be preferr'd before them, because they heat less; these Waters kept up the Pulse in a lean Person to 90 Beats in a Morning, so that all *Bath Waters* evidently Heats us; but their chief Use is to dilute and cleanse the salt and sily Humours. I prescribe *Buxton Waters* every Morning one Quart warm'd to the Hectical, to Bleed once in a Month, Riding two Hours before Dinner: The *Cortex*, with *Diacodium*, upon extraordinary Heats, once in a Month; and three or four times in a Week cold Bathing, which stops the Night-Sweats, and causes Sleep. I have oft prescrib'd the Water of *Buxton* from *St. Ann's-Well* for Vomitings, want of Appetite, pains in the Stomach, consumptive Coughs, scorbutic Itchings in old Persons, Stone, Scurvy; and I can now upon certain Experience recommend it to be Drank for the same Cases, as the Waters at *Bath* are us'd; and for Histerical, Asthmatic, Gouty, and all Defluxions, and hot Tempers; 'tis more safe because

it

it does not so much affect the Head, as *Bath Waters* does, which oft produces Giddiness, and a Stupor to all the Senses; and in many it has deprav'd the Memory, occasion'd Apoplexies, Lethargies, Hemorrhagies, and Rheumatisms; it has done much Injury to the Hysteric, and Hypochondriacal, and Asthmatic; and the Convulsive, if it be Drank very hot; the Bathing at *Buxton* is suitable to all hot Diseases, as well as the Drinking.

I have caus'd *Buxton Water* to be carry'd in Bottles forty Miles, and they may be Drank either Cold or Warm. This Notice I thought fit to give my Country-Men, that they might have the benefit of *Bath Waters* near Home.

I observ'd the Pulse of a thin Woman in the Cholick by eating Fruit 100 in a Minute; the Pain rais'd the Fever, but the Pulse sunk much after Bleeding.

The Pulse in a Cholick of the Stomach, which was occasion'd by the Obstruction of the Menses, beat 100 in a Minute; twice Bleeding reliev'd that Pain, which seem'd to me an Inflammation.

The Pulse in the pain of the Piles did beat 90 in a Minute.

A great Pain in the Head made the Pulse about 86 in a fat Woman; the Pulse



in a rheumatic pain of the Back and Hips was 100.

The Pulse in the Green-Sickness beats 90.

The Pulse in the Neck was the same. Obstructions in the lower Parts turn'd the Circulation more into the cephalic Arteries.

In *February* I observ'd a Quinsy attended with a breaking in the Throat, and sometimes with a Scarlet Fever; the Pulse was from 100 to 120, it was not hard, tho' the Blood was fizy; the Glandules were more inflam'd than the Muscles, and the Pulse was soft, languid, very frequent, Bleeding in the Neck reliev'd them, as well as Sweating, and Blisters; but they were very Fainty upon Bleeding.

The Pulse in a Loosness appear'd quick and frequent, by which I perceiv'd that a Fever was the original Disease; and not the Loosness which would have made the Pulse small, and slow, or undose; from this Observation I took this Rule, that where two Diseases are mix'd, that is the cause of the other which has the most prevailing Pulse.

I observ'd in the ordemutous Swelling of the Legs, the Pulse beat 62 in a Minute.

I observ'd the Pulse in a *Cholera* to be Feverish.

In Consumptions the more frequent the Pulse is, the more is the danger; the quicker the Pulse is in the Dropsy, the more Thirst, Cough, and less Appetite.

In long Diseases the Pulse grows less frequent, and becomes more weak and rare, through Viscidity of Humours, and Consumption of Spirits; then the Disease is usually fatal, when the time of the Year increases the Pulse of the Disease; so acute Diseases in the Spring and Summer, and cold in the Winter are fatal.

If Diseases from Obstructions be not reliev'd by Evacuations, they are usually fatal.

We know the Errors in Venery by the slow Pulse, a little renders Nature more lightfom; if by too much, the Colour of the Face is squalid, more Pale, with a Lassitude, and the Body becomes dry and hard.

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P A R T III.

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C H A P. I.

*Concerning the Chinese Art of feeling the Pulse, and their Practice of Physick grounded on the Knowledge of the Pulse.*

**I** Think my self oblig'd in this Treatise about the Art of feeling the Pulse, to make some Remarks on the *Chinese* Skill in that Art; and I will first prove that they have a real great Knowledge in that Practice, and that they may well build a Practice of Physick on their Art of feeling of the Pulse; and I will endeavour to help the Reader in his Imitation of this Practice, by some Tables which will shew the Pulse in each Climate, Age, Constitution, Diseases; the natural dependence of each Disease on the Circulation

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tion

tion of the Humours, when it runs too fast or too slow ; and I will add some Tables of Diet, and a Cabinet of Medicines according to their several Physical Tastes, by which the Circulation and Pulse may be reduc'd to their natural and healthful Motions and Temper.

I. I will prove by the following Relations, that the *Chinese* have found out the real Art of feeling the Pulse.

*Samedo* the *Portuguese* commends them for their Skill, and says, they never ask their Patients any Questions, they feel the Pulse in both Hands laid on a Pillow ; and they observe their Motions a great while, and afterwards tell what the Patient ail-eth ; and he farther saith, That the good and learn'd Physicians seldom fail ; he also observes, that they lay the Breast bare, and that by the Pulse they can tell all Alterations in Diseases.

Farther *le Counte* says, That a *Chinese* Emperor writ about the Pulse 4292 Years ago, since which the *Chinese* have been Famous for Pulses ; they pretend to have distinguish'd all manner of Pulses, and that all Diseases may be known by them, because every Disease alters the Blood or Spirits, and consequently the Pulse ; they hold

hold the Pulse sometimes the Right, sometimes the Left, and sometimes both; they lay their four Fingers along the Artery, and when they have press'd the Artery strongly, and by degrees, they raise them again by degrees, till the Blood recovers its Course; then they press the Arm again, and hold it a considerable time till they discern all the Disorders of the Pulse, and then they tell the Disease.

In the general Description of *China* by the Embassy from the *Dutch East-India Company*, I find this Account; as to Physick and Chyrurgery they are Expert therein, and their Rules of Art differ not much from those of the *European* Physicians; for first they feel the Pulse like them, and are Skilful in discovering by the same the inward Distempers of the Body; in each Hand they take Notice of six distinct Beatings of the same, namely, three high, and three low; which, as they conceive, have some secret Coherences with certain Parts of the Body; as that of the first to the Heart, of the second to the Liver, of the third to the Stomach, of the fourth to the Spleen, of the fifth to the Reins, &c. the Author has not nam'd the sixth, but I suppose it is the Lungs (because they alter the Pulse much by an Inequality)

and farther, that they may with more certainty of Judgment deliver their Opinions, they are, at least half an Hour in feeling the sick Person's Pulse

I think it not difficult to understand this Account of six Pulses.

If we by the Liver understand the Blood in sanguine Tempers, which makes a moderate, strong and full Pulse, moderate in celerity and frequency; this is a moderate high Pulse among the *Chinese*, when the Pulse runs a little above the healthful mediocrity of Pulses.

The second high Pulse respects the Heart, by which we must understand the vibrating high Pulse in choleric Constitutions, and such Cacochymias.

The third high Pulse must respect the Lungs and Glands, by which we must understand the salt *Serum* in Defluxions, Catarrhs, and all the scorbutic Cacochymias.

The 1st low Pulse respects the Stomach, that is, the phlegmatic Humours, which are very eminently visible in it.

The 2d low Pulse respects the Spleen, by which we must understand the acid, thick, splenetick Blood.

The 3d low Pulse respects the Reins, by which we must understand the watry *Serum*.

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By the high Pulses, we must understand the Pulses which have exceeding Numbers; and by the low, those which have deficient. 'Tis ridiculous to believe that the Pulse can depend in its Alterations on the solid Parts of any *Viscera*, but it does evidently alter by the Fluids; therefore 'tis obvious that the *Chinese* respect the Fluids, which are secreted by those Parts in feeling of the Pulse; and if this be a fair Conjecture, I have probably accommodated the *Chinese* and *Grecian* Art of feeling the Pulse. Mr. *Wotton* quotes this from *Cleyer*.

The *Chinese* divide the Body into three Regions, the first from the Head to the Diaphragm, the second from thence to the Navel, containing Stomach, Spleen, Liver, Gall; and the third to the Feet, containing Bladder, Ureters, Reins and Guts; to these three Regions they assign three sorts of Pulses in each Hand.

Mr. *Wotton*, in his Reflexions on ancient and modern Learning, gives an Account of an ancient *Chinese* Physick-Book, call'd *Nay Kim*, which describes the Production of our Bodies; and the Relation of the several Parts, with the five Elements, which I will endeavour to Explain, that I may vindicate the *Chinese* way of

Practice, and find as much natural Phylofophy in their Writings, as was in *Hippocrates*, in *Plato's* and *Aristotle's* Time, and their Anatomy was not more Exact than the *Chinefe*. In this Difcourfe quoted from *Cleyer*, I find good Senfe, tho' exprefs'd in the *Asiatic* way, whose Words are forts of Hieroglyphicks, as well as their Characters; and their Expressions are fitter for Poetry and Oratory, than Phylofophy; the *Asiatics* have a gay luxurious Imagination, but the *Europeans* excel in Reasoning and Judgment, and clearness of Expression.

'Tis necessary to give a short Account of the *Chinefe* Phylofophy, before I begin the Explication of this old Book.

In the beginning they say the World was produc'd out of a Universal Substance, which they call *Chaos* or *Vacuum*, and that they call *Li*; out of this arose an Air call'd *Kie*, which by Motion, Heat and Rarification, or Cold, Rest and Condensation, produc'd five Elements, Water in the North, Fire in the South, Wood in the East, Metal in the West, and the Earth in the middle.

This Phylofophy makes Matter eternal, as the *Greeks*; and that the World was produc'd by Chance, and govern'd by Fate;



Fate; and that at first all Things were produc'd out of Matter, and are reducible into the same, so that all Things are one; but the qualify'd Air is the Matter of Spirits. Since this Philosophy is like that of the *Epicureans*, our Western Philosophers do not exceed the *Chinese Literati*, who went as far as Reason could lead them in the Production of the World, 'tis only Revelation, which can discover the true Philosophy of the Creation, and the Nature of the God who made all Things.

*Here follows the Quotation out of Nuy Kim, which is put in a different Character.*

*Out of the Eastern Region arises the Wind, out of the Wind Wood, or Plants, out of Wood Acidity.*

*The Explication.*

In the Spring the Summer Monson arise, then the Wood and Plants grows, and shoot forth Leaves and Fruit, in which there is an Acidity.

*From thence the Liver, from the Liver the Nerves, from them the Heart; the Liver is generated the third in order, and perfected the eighth.*

The Liver is here taken for the Nourishment, bred from acid Fruits; in the Summer, on which the *Asiatics* feed; and  
thence

thence the Blood is prepar'd by the Liver; the Nerves have their Fluids from the Blood, generated by the Liver, and the Heart is mov'd by the Spirits.

*Note, That by the Liver the Chinese understand Blood, and not the Gall.*

*The Spirits of the Liver, as they relate to the Heaven, or Air, are Wind, as Wood in the Earth, as the Nerves in the Body, so is the Liver in the Limbs.*

This is the Description of the vital Spirit in the Blood, which is Air; and when this is communicated to the Limbs by the Nerves, it moves the Limbs.

*Its Colour is Blue, and its Use and Action is to move the Nerves.*

The Colour of the Face is describ'd, and the Production of Animal Spirits is the chief use of the Digestion and Circulation of Humours.

*The Eyes are the Windows of the Liver, its Taste is Acid, its Passion or Affection is Anger.*

We see all Diseases in the Eyes, when the Liver or Blood is affected, the Taste of the Blood made by the Liver is vitriolic Acid; the hot choleric Blood inclines to Anger.

*Anger hurts the Liver, but Sorrow and Compassion conquers Anger; because Sorrow is*  
the

*the Passion of the Lungs, and the Lungs are Enemies to the Liver.*

Anger accelerates the Motion of the Blood, Sorrow and Compassion conquer Anger, as they are contrary Passions, they expel one another; the Lungs are evidently affected by Sorrow, as the Liver is by Anger; the Liver makes the Blood hot by its Choler, the Lungs cool it by inspir'd Air.

*Wind hurts the Nerves, but Drought the quality of the Lungs, conquers Wind; Acidity hurts the Nerves, but Acrimony, or that sharp Taste which is proper to the Lungs, conquers Acidity, as Metal conquers Wood.*

Any Preter-natural Windiness affects the Nerves with Convulsions; this Wind is perspir'd thro' the Lungs from the Blood by Respiration.

Acidity hurts the Nerves by Convulsions, or by fixing the Spirits, the acrid Salt which is evident in the Limpha of the Lungs, is contrary to that Acidity, and corrects it.

The Design of the preceeding Discourse is to explain the generation of the Blood by the Liver, and the Animal Spirits from it; and I must observe, that this old Author takes Notice of the Acid Taste, as  
well

well as Acrid; so, tho' the Practice of Physick by the Pulse be Mechanical, yet the *Chinese* require some Knowledge of Anatomy, and the knowledge of the Tastes of Animal Humours.

*Out of the Southern Region arises Heat, out of Heat Fire, out of Fire Bitterness; from it the Heart is generated, thence the Blood out of Blood comes the Spleen, or Earth out of Fire*

The Sun produces Heat and Fire, which produces the Bitterness in Plants and Animals, by digesting their Juices; the motion of the Heart produces the Heat of an Animal, and the Blood is bred by the Heat; Heat burns the Blood, and like the burnt Earth the splenetic Juice is bred.

*The Heart governs the Tongue, that which is Heat is the Heavens, Fire upon the Earth, Pulsation in the Body, is the Heart in the Members.*

The Heat of the Heart is seen by the whiteness of the Tongue; the Heat in the Members proceed from the Heart.

*Its Colour is Red, has the sound of Laughing, its Vicissitudes are Joy and Sorrow; the Tongue is its Window, its Taste, Bitterness, its Passion, Joy; too much Joy hurts the Heart,*

*Heart, but Fear the Passion of the Reins, which are Enemies to the Heart, conquers Joy.*

Blood colours the Face red, Joy, Laughing, Sorrows are Passions of the Heart; Heat gives a bitter Taste to the Tongue, and its Colour shews the excessive Heat; we cure too much Joy, which injures the Heart by Fear, which affects the Reins; because in Fear the Urine flows plentifully, as we find in Melancholics and Hysterics, and by the watry Reins the Heart is cool'd, Loquacity depends on Heat.

*Heat hurts the Spirits, but Cold conquers Heat; Bitterness hurts the Spirits, but the saltness of the Reins conquers Bitterness, or Water quenches Fire; the Heart is generated, the second in Order, and is perfected the seventh.*

Contraries Cure one another, as Cold, Heat, which too much rarifies the Spirits; Bitterness hurts the Spirits by too much Rarification of them, but the saltness of Urine conquers Bitterness.

There are many curious Remarks here that Bitterness is caus'd by Heat, that Bitterness affects the Heart, that Bitterness hurts the Spirits, and that it is cur'd  
by

by the Saltness of Urine; so *Coloquinda* abates the Bitterness, if infused in Urine; Cholera produces Deliriums, and thereby hurts the Spirits; the Blood is heated by the Heart, and the Spleen-Juice is produced by Fire; the *Chinese* cure Diseases by Contraries, as the *Greeks* did, and both imputed Diseases to the Tastes of Humours.

The Heart is generated the Second in order, but they affirm, that the Reins were the first; by which may be understood, that the Salt Albumen in the Egg appears first, the Heart and Blood second in order, the Liver the third, the Lungs the fourth, the Spleen the fifth, in order.

*Out of the Middle Region ariseth Moisture, out of that Earth, out of the Earth Sweetness, from Sweetness cometh the Spleen, Flesh from that, and the Lungs from Flesh.*

Rain cometh from the Middle Region, and Earthy Parts settle out of it, and from the Earth a sweet Juice is prepared for Plants, from sweet Blood the Spleen-Juice is prepared, by Adustion Flesh is bred out of a sweet Nutritious Juice, the Lungs are made of a Membranous Flesh.

*The Spleen governs the Mouth; that which is Moisture in the Heavens, in Earth*

*is Earth, Flesh in the Body, and Spleen in the Members.*

The Splenetics are great Spitters, and have Ulcers in the Gums. Water produces Earth, in the Body 'tis the Nutritious Juice, and that is called the *Spleen* in the Members.

*Its Colour is Yellow, it has the sound of Singing, its Window is the Mouth, its Taste is Sweet, its Passion is much Thoughtfulness.*

The Colour of the Splenetic Face is Yellowish, because the Liver is obstructed where the Spleen is ; the Splenetic have Singing in their Lungs ; the Spleen is known by the Mouth, there is a sweet Bloody Taste in the Mouth from bleeding Gums, the Splenetic are very Thoughtful.

*Thoughtfulness hurts the Spleen, but Anger conquers Thoughtfulness, Moisture hurts Flesh, but Wind conquers Moisture.*

Thoughtfulness is injurious to the Splenetic ; but Anger is a contrary Passion, and helps the Stagnation of Blood in Obstructions.

*Sweetness hurts the Flesh.*

Too much Moisture swells the Flesh, but Wind or the Animal Spirits, help the Circulation of Humours ; the Splenetic  
are

are Lean thro' a crude sweetness, in time the Acidity prevails.

*In a word, Wood conquers Earth, or the Liver the Spleen.*

As Wood grows out of the Earth, so the acid Splenetic Juice at last mixes with Choler, and this is the Atrabile, and then they Vomit Bitter and Sour.

The Remarks out of the former Description of the Spleen, are, That the *Chineese* observe, that Plants have a sweetness from the Earth, and there is a vitious sweetness in Splenetics, which ferments into Wind; and all sweet Things disagree with the Splenetics, by Fermenting and turning Sour; this is the true Melancholic Juice, and when Choler is mixt, 'tis the Atrabilis; this Humour affects the Nerves with Wind, of which the Singing in the Ears is a sign, or the Singing of it is a sign of Delirium.

*Out of the Western Region, arises Drought, thence comes Metals, from them come Sharpness, out of that are the Lungs, out of the Lungs come Skin and Hair, out of Skin and Hair come the Reins, the Lungs govern the Nostrils; that which is Drought in the Heaven, or Air, is Metal*  
in



*in the Earth; Hair and Skin in the Body, and Lungs in the Members.*

Here the Effects of Driness is described, which appears in the Air when the Wind stands West, and the same Driness is in Skin and Hair; and all Salts have a Driness, the Lungs have that sharp Salt in their Lympha, and that is called the Lungs, and out of that is produced Skin and Hair; and the same sharp Salt appears in the Kidneys, as well as Skin and Hair upon Sweating; Lungs in the Members is the Perspiration of a Salt Lympha, the Motion of the Nostrils alters in Dyspnea's.

*Its Colour is Whitish, has the sound of Weeping, its Windows are the Nostrils, its Taste is Sharp, its Passions Sorrowous.*

The Colour of the Face is Whitish, they make the Noise in Weeping by sobbing and sighing in Sorrow, the Taste of its Lympha is Salt and Sharp in its De-fluxions.

*Heat hurts the Skin and Hair, but the Cold of the Reins conquers Heat, Sharpness hurts the Skin and Hair, but Bitterness conquers Sharpness.*

The Skin and Hair are over-dried by Heat, but the Watry Nutriment cools them, sharp Humours Ulcerate the Skin,

R

but

but Bitter Medicines deterge and heal them.

The Reins signifie the Watry Humour which is Cold.

*Out of the Northern Region, arifes Cold, out of Cold Water, thence Saltnefs, thence the Reins, thence the Marrow of the Bones, thence the Liver.*

Here the Effects of Cold are described, which appears in Cold Air and Rain, Saltnefs is diffolved in the Water, and it appears in the Urine also, the Marrow is condensed, as Oil is by Cold, and the Liver or Blood is cooled by Cold or condensed by it.

*The Reins govern the Ears, that which is Cold in the Air, Water in the Earth, Bones in the Body, is Reins in the Members.*

The Salt Humours makes a Defluxion on the Ears, and caufes Deafnefs, as the Water caufes Cold in the Air and Earth; fo a Salt Rheum caufes Cold in the Bones and Members.

*Its Colour is Blackifh, has the found of Sobbing, its Windows are the Ears, its Taffe is Saltnefs, its Paffion is Fear.*

The Colour of the Face is Blackifh, the Tears which flow in Sobbing are Salt, the Excefs of Salt Humours are known by

by Deafness, the Taste of the Urine is Salt, and Fear accompanies Watry-Blood.

*Cold hurts the Blood, but Drought conquers Cold; Saltness hurts the Blood, but Sweetness conquers Saltness.*

Watry Humours make the Blood cool, but Driness conquers Cold, by evacuating of the *Serum*; here is the Cure of Saltness by Sweetness; so Infusion of Liquorish or Milk cures the Saltness of Blood.

The *Asiatics* have an obscure, sublime way of Expression, and in describing the several *Cacochymias*, they chiefly describe the Parts which produces them, to which their 6 Pulses relate.

*The 3 high Pulses of the Chinese.*

1. In Description of the Liver, the Sanguine Temper is described, and the Spirits of the Liver or Blood move the Nerves, and make a full and great Pulse.

2. In Description of the Heart, the heat from whence Cholera is produced, and its Bitterness is described; and this is the

Choleric Cacochymias, which has a high, vibrating, quick Pulse.

3. In Description of the Lungs, the Salt Rheum is described, and this must have an unequal Pulse, as in all Defluxions on the Lungs.

*The 3 low China Pulses.*

1. The Cold Watry Humour is described with the Reins, and this will have a soft, slow, rare Pulse; under the Watry Humour, the *Chinese* must comprehend the Phlegmatic Cacochymia, which is most evident in the conglomerate *Glands*.

2. The Splenetic Humour is described with a sweetness at first, then it becomes Acid, and by a mixture with Choler, it makes the Atrabilis; this makes a high Pulse, but the other a low Pulse.

3. The Pulse which relates to the Stomach, must be the Phlegmatic Pulse, rare, slow, weak; or an oppressed Pulse, from too much Meat, or corrupt Humours in the Stomach. This is high and low mix'd.

These following Remarks I shall farther make on the *Chinese* Art, by which we may discern their Skill.

1. That

1. That their Art is Older than the *Galenic*, as appears by the Old Book writ 4000 Years ago; besides, the *Chinese* might find out this Art by Experience, as well as the *Greeks*. Neither the *Greeks* nor *Chinese* had formerly the true Anatomy or Philosophy, by which the Pulse is now explained. Experience is the only Foundation of this Art, the Notions are taken from Anatomy and Philosophy, which were not the same in different Ages; the *Chinese* have had the longest Experience, and probably have the most exact Knowledge of the Pulse, and therefore have built their Practice on that Skill.

2. The *Chinese* make their Pulse to refer to the same *Cacochymia's* as the *Greeks*; and they describe the Choleric by Bitterness, the Splenetic by crude Sweetness, the Salt *Cacochymia* by Saltness, the Sanguine by Windy Spirits and Acidity: This is the fermenting Temper of Humours.

3. The *Chinese* observe the heat of Blood, and the coldness; the Driness in the salt Constitution, and the Moisture in the Watry; hence it appears that in the Mechanical *Chinese* Practice, some Anatomy of the Solids, and the Tastes of the Fluids, is necessary; and as the *Greek*

imputed Sanguification to the Liver, so the *Chinese* do also.

4. The *Chinese* cure by contrary Tastes, for they, as I have Quoted above, say, Acrimony cures Acidity; Cold is cured by Heat, Acidity conquers Sweetness, Dryness Conquers Wind; Wind, (or Spirits) conquers Moisture, Bitterness conquers Sharpness, Sweetness conquers Saltness.

5. The *Chinese* take half an Hour to feel the Pulse, and in less time 'tis almost impossible to consider the differences of the Pulse, and the several Causes of its Alteration; the Pulse of the Climate, the Pulse of the Constitution, Age, Sex, time of the Year, Diet, Air, Exercise, Passions, Excretions, Obstructions of them, Watching and Sleep; and then we must consider all the Diseases of the Blood and Spirits; and the *Chinese* lay the Breast bare to observe the Skin, or Motion of the Breast in Respiration. This *Samedo* affirms. And besides the Intimation given us by the Pulse, we may consider the heat in the Hand, the Habit of the Body, whether Plump or Lean? the Colour of the Face, Pale, Ruddy, Yellow, Blackish; which also shews the several Cacochymias; the Motion in the Eyes, shews the Heaviness

vinefs, or Defluxions on the Head ; the alteration of the Respiration, fhews the Difcafes of the Breast; the *Oedematous* Habit, defect in a Circulation; the Scurff or Pustules in the Skin, the Salt Temper of Humours; the Liver obftruded makes the Skin Yellow ; the Spleen livid, the Reins or *Glands* Hydropical, and the Face is Pale, the Motion of the Body, and quick Speech, fhews a hot Temper, the deficient, or weak and flow Speech and Motion, fhew cold Tempers; Restlefsnefs fhews Pains ; by a *Ructus* we difcern the diforders of the Stomach. All thefe things muft be confidered, if we defign to imitate the *Chinefe* Skill, whereby we defign to find out a Difcafe, without being told of the Symptoms ; by which we may procure great Reputation among the Vulgar, who among us expect that we fhould difcover all by the Urine, as the *Chinefe* do by the Pulse ; but why fhould I not ufe all my Senfes, as Sight, Tafte, Smells, as well as my Feeling? thefe difcover truly the Difcafes of the Solids, and the feeling of the Pulse, the feveral *Caco-chymias* produced by a quick or a flow Circulation. *Quacks* and *Emperics* are to be met with in all Parts of the World, fuch Jugling Practicers are mentioned by

Father *le Counte*, who Prognosticates ridiculously ; you were never troubled with the Head-ach, but with a Heaviness ; you have lost your Appetite, but will recover in three Days ; this Evening your Head will be free. The *Chinese* can tell how many Days, or Hours, a Sick Man can live, or how many Years a Man in Health can live. These are ridiculous Pretences, tho' mentioned by Sir *William Temple* and others. *Le Counte* says, they get themselves instructed secretly about their Patients Condition, before they visit him ; and that they feign Distempers, which they afterwards Cure ; these are only the Tricks of the Ignorant, and this must not prejudice the Skill of the true Artists and their Reputation ; for such *Samedo* affirms there are in *China*. 'Tis a great mistake in the *Missionaries* not to Translate the *Chinese* Books about the Pulse, but to give their unskilful Account in general about the Pulses.

6. 'Tis probable that the *Chinese* want many of our *European* Diseases, as Gout, Stone, Dropsies, Rheumatisms, and that the equality of their Climate preserves their Health much ; and that they are Sick only on the coming of their Rains, with Fevers and Loosness, twice in a Year



Year, which they may easily know by their Pulses; so in *Europe*, we have our Spring and our Autumnal Fevers, and these may be easily known by the Pulse; and there is also an Epidemical Disease every Year, to both, if a Physician has a due respect, he may soon know them by the Pulse; and by a small Experience, we may tell the Patient of all the Symptoms which attend his Disease.

*Navarrette* says, the Practice of Physick is very Ancient in *China*, one of the first Five Emperors introduced it, his Books are preserved to this Day, his Successors have advanced this Faculty but little; *Father Coplet* is a violent Asserter of the *Chinese* Physicians, and he is about Translating their Books for the Improvement of *Europe*. *Navarrette* says, the *Chinese* neither study nor know any thing of Philosophy; and he makes the Physicians meer Empirics, of no Learning, nor have any Degrees; but he acknowledges that *Coplet* and others, very much valued their Physicians, and that many false Accounts are given of *China*. *Bartoli* in his History of *China*, magnifies their Physicians, but *Gemelli* does not; by which it appears, that the *Missionaries* do not understand their Physick. *Gemelli* says, the Physicians  
carry

carry their Drugs with them, and they are paid for their Medicines, not for their Visit; their Empericks pretend to make Men immortal, and young again.

2. I will next shew how the *Chinese* ground their Art of Physick on the Knowledge of the Pulse.

*Samedo* tells us, That having felt the Pulse, they Compose their Medicines, and that the Physicians have always a Boy following of them, carrying a Cabinet with five Drawers, each of them being divided into forty Squares, furnish'd with Medicines.

The *Chinese* have divided their Pulses into the three High, which are the exceeding Pulses, and the three Low, which are the deficient Pulses; for the high they use the cold Regimen, and for the low the hot Regimen.

*Fernandez* says, They first forbid Eggs, Fish, Flesh, which is the hot Diet; but allow Rice-Broth, or Rice boil'd with Herbs, this is their cool Diet; some Diseases they cure by Fasting, and will not allow any thing but boil'd Water, or *Thea*, formerly call'd *Cha*, they drink all their Liquors hot.

When they prescribe a hot Diet, they give Goose Eggs, salted Fish, roasted Meats,

Meats, which *Fernandez* says, they give to those who recovers. He says, They never Bleed, nor Purge, or give Glisters; the Reason of which I guess, is, because all their Diseases are to be cur'd by Sweating, for which they use hot *Thea*; and *le counte* says, their Pills are Medicines to Sweat, to fortifie their Stomachs, suppress Vapors, but seldom Purge; but *Samedo* says, they purged a Father in the Measles, and that it was like to Kill him.

In hot Countries the Stomach is very weak, because the Heat produces an excessive Perspiration, this makes Cordials, Spices, and Digestives necessary; but in cold Countries, the Stomach is very good, and the Pulse great and strong, and hot *Theas*, Cordials, and hot Diet, are not so necessary.

The *Chinesse* great Cordial is *Genssem*, which tastes sweet and bitterish, with a smell of Musk, they give the quantity of Sixpence in a Decoction; this *Genssem* seems to me an artificial Thing, and may be a *Scorzoneria* Root, steep'd in some infusion of Musk; 'tis certainly of a Musk Taste, and has the Virtue of it as a high Cordial.

The *Chinese* Disease arise chiefly from great Heat, which causes them to impute all their Diseases to a corrupt Wind, for which they apply Cupping-Glasses on their Belly in Cholicks, and hot Needles or Cauteries to other Places for the Wind; and they apply a hot Iron to the Soles of the Feet for the Cholick, and they use Bathing in Rivers.

The Heat of the Climate dispose the *Chinese* to great Perspiration, by which alone all Diseases perspire. *Bellinus* tells us, That six Pound is perspir'd at *Naples* in one Day, and in *England* 'tis commonly about three Pound; therefore we must not cure our Diseases by Diaphoretics, but by Bleeding, Purging, Diuretics, rather than Sudorifics. *Samedo* mentions five Drawers, with forty Squares in each Physician's Cabinet, which makes their Simples to amount to two Hundred. I have in imitation of this sorted all our Medicines by their Tastes, and have propos'd an *English* Cabinet of Medicines; but I have not confin'd my self to *English* Simples, but chose those which are most easily procur'd among us; and it must be observ'd, that the *Chinese* have their *Gensem* from *Tartary*; and since we have *Coffee* and *Thea*, and *Chocolate*, which are  
part

part of our Diet from *India*, why shall we not have our Medicines thence, if they exceed ours in Virtue?

The Physicians themselves in *China* are Apothecaries, and when they Visit their Patients, they carry a Servant loaded with their Medicines, this *Navarette* reports. And he farther says, They know nothing of Potions; their greatest Cure is a regular Diet, which is agreeable to *Galen*; the greatest Medicine is Abstinence, they use little *Rhubarb* in *China*, but more of the *China* Root; Purgings is not so suitable to hot Countries as Sweating is.

The *Chinese* eat Horse-Flesh, Asses, and Dogs-Flesh, and drink warm *Thea* after them to help their Digestion.

The *Chinese* drink their Rice. Wine hot, as well as all other Liquors.

3. I will next shew, how we must imitate the *China* Practice, and tell the Vulgar all their Diseases, without asking them any Questions.

1. We must consider the time of the Year, and what Diseases happen then; so *Hippocrates* tells us, Madness, Melancholy, Epilepsies, Hemorrhagies, Quinsy, Hoarsness, Coughs, Pustules, Boils, Pains, and

and Leprosies happen in the Spring. In the Summer, some of these continue, and burning Fevers, Tertians, Quartans, Vomiting, Diarrheas, Ophthalmics, Ulceration of the Mouth, Pains of the Ears, and Pustules in the Skin, arise.

In Autumn, many of the former continue, Quartans, Erratic Fevers, Spleen, Diseases, Dropsies, Consumptions, Strangury, Lientery, Dyssentery Sciatica, Quinsy, Asthmas, Iliac Passions, Epilepsies, Deliria.

These are the Winter Diseases, Pleurifies, Inflammations of the Lungs, Catarrhs, Hoarseness, Coughs, Rheumatisms, Pains in the Breast, Sides, Loyns, Head, Vertigo, Apoplexies, Lethargies; the Pulse in these several times of the Year alters something.

2. Consider what Diseases happen in each Age.

These happen to Children when very Young, sore Mouths, Vomiting, Coughs, Watching, Frights, Inflammations of the Navel, running of the Ears, Gripes, Red Gum; when Children breed Teeth, Itching of the Gums, Fevers, Convulsions, Diarrhea's.

As Children grow Older, Rickets, Asthmas, Stones, round Worms, Ascarides, Warts,

Warts, Stranguary, Satyriasis, Strume Boils, Ruptures, Small-Pox, Measles.

From 14, Young Men are subject to Spitting Blood, Consumptions, Sharp Fevers, Epilepsies, Hemorrhagies at the Nose, and many of the former Diseases.

In the middle Age, Asthmas, Pleurifies, Peripueumonia, Phrensies, Lethargies, Burning Fevers, long Diarrheas, Choleras, Dysenteris, Lienteries, Hemorrhoids.

Old Men have short Breaths, Catarrhs, Stranguaries, Pains in the Limbs, Lethargies, Vertigo, Apoplexies, Stone, Gout, vehement Itching, dulness of Senses, running of the Eyes, Deafness, Driness, Scales, ill Colours in the Skin.

3. Observe the different Seasons, and their Diseases; in wet Weather there are long Fevers, Loosness, Putrifications, Epilepsies, Apoplexies, Quinseys.

In very dry Weather, Consumptions, Ophthalmies, Rheumatisms, Gout, Stranguary, Dysentery, and sharp Fevers, Plague; the South Wind which brings Rain, makes the Head dull, relaxes the Nerves, occasions Defluxions.

The North Wind is cold, and produces Defluxions, Coughs, Hoarseness, Pains, and binds the Body, causes Difury.

4. We

4. We must consider what Epidemical Disease reigns every Season, Small-Pox, Measles, Intermitting-Fevers, Cholick, Jaundice, Rheumatism, Coughs, Agues.

5. We must consider the natural Pulse which belongs to each Climate, the most Temperate is in the 45 Degrees; all Degrees nearer the *Æquator* have exceeding Pulses, those nearer the Pole have deficient Pulses.

6. Consider what particular Constitution every Patient has, and what Number of Pulses in Health.

7. Consider how far the natural Pulse is alter'd by the present Times of the Year, Ages, Seasons of Weather, Sex; and by the Diet, Exercise, Passions, Retentions, Excretions, Sleep, Watching.

8. We must consider what Cacochymia tinctures the Blood, and alters the Blood and Spirits, or circulatory Organs, which we may know by the Pulses; and these are the Antecedent Causes of every Disease.

9. Consider whether the Pulse exceeds or is deficient, and what Diseases belong to the exceeding or deficient Pulses, and to the several Cacochymias.



10. By the Pulse we know whether the Circulation and Secretions run too fast, or too slow; and thereby we may guess at the Preter-natural State of the Blood and Spirits; but 'tis not possible to know all these Diseases of the solid Parts by the Pulse, nor those of the Fluids, which are extravasated. I can tell that any Person has a Pain by the Pulse, but I cannot tell in what Part it falls by the Pulse; therefore when we Prognosticate, we must say there is a Pain in some Part from such a Cacochymia; so in inflammatory Pains the Pulse is as in other Inflammations, great, quick, frequent; in Pains from a salt Cacochymia the Pulse is less, frequent, and quick, and the Fever less; these are scorbutic Pains.

In nervous Pains there is a Tension of the Nerves by a Convulsion, and the Pulse is as in the *Atrabilis*, which produces Convulsions.

In the *Quartans*, the *osteo copos* Pain is from the vitriolic Cacochymia, and the Pulse is more rare than in ordinary Fevers.

In the heavy phlegmatic Pains the Pulse is little accelerated, the Humours are not sharp, but have a windy Rarification, and cause Pain by tension and fulness.

II. I will here endeavour to reduce all Diseases to a quick or a slow Circulation, which will very much conduce to our better knowing of Diseases, and the Cure of them by the Pulse.

I. The Blood is ill prepar'd when the Circulation runs too high, or too low, above or under the natural moderate Motion; and when the Motion is unequal.

The Circulation runs too quick in Fevers, Pains, Defluxions, Inflammations, Vapors, Passions in *Deliria*, Hysteric and hypochondriac Melancholy, in scorbutic Cases, and Diseases from Cholera, salt Serum, or *Atrabilis*.

The Circulation is too slow in Dropsies, Cold, Cachexies, Fluxes, Palsies, Lethargies, and all Diseases from the phlegmatic, watry, or crude *Acerbe Cacochymias*.

The motion of the Blood is unequal in Obstruction or Compressions on the circulatory Organs, in a Polypus, Intermittent Pulse, Asthma, Dropsie of the Lungs, Convulsions.

All the motion of our Humours are known by the Pulse, according to *Bellinus*, *Necessario a motu sanguinis vitium Pulsus*, therefore by that we may easily know that

that the Blood moves too fast in exceeding Pulses, too slow in the deficient; very strongly, weakly, too frequent, or too rarely.

The great Heat, Rarification or Condensation, and Coldness, are from a Circulation too quick or too slow.

2. The quantity of Humours is increas'd by a moderate Circulation, such as is in sanguine Constitutions; when the Pulse runs betwixt 70 and 75, the quantity of Humours decreases in the Choleric, where the Blood moves too fast; and the farther the Pulse recedes from the Temperate, the less is the Flesh, and quantity of *Succus Nutritius*.

In an exceeding quantity of Blood (by which I understand the Chyle, Serum, viscid, cake, and secretious Humours, which are all mix'd, and contain'd in the Vessels) the Pulse is oppress'd, in a moderate quantity, the Pulse is full and great; in a defect of Humours the Pulse is small, soft and empty.

The Pulse moves slowly in the Fat, and more swiftly in the thin and lean Habits, Hunger, Thirst, Fasting, Exercise, Study; all the hot Diet, and hot Regimen and Evacuation by Stool, Urine, Sweat, Bleeding, empty the Veins.

A full temperate Diet, such as Milk, sweet Wines, gentle Exercise, soft Friction, tepid Baths, stopping Evacuations, much Sleep and Rest, and cold Baths, fill the Veins.

3. The Blood is vitiated in its Quality by the hot Cacochymias, such are the bitterness, saltness and vitriolic Acidity, all which are produc'd by a quick Circulation. In the cold Cacochymias, the Blood moves too slowly, as in the sweet, slimy Blood, in which the lacteal Lympha abounds; in the acid Slimy, the vitriolic taste of the Blood mixes with the lacteal Lympha; in the serose, thin Bloods, the Serum or Water abounds.

4. The Blood is vitiated in its Consistence, when it is too viscid, or too thin; and viscid Humours are bred from a high and exceeding quick Circulation, or for want of a vigorous Circulation; from the number of Pulses 75 to 90, the Viscidity or Siziness encreases by Heat, and a frequent Circulation from 70 to 60, the gelatinous Viscidity encreases through want of a vigorous Motion to attenuate it.

The Blood wants Viscidity, and its Fibres are dissolv'd in pestilential Fevers, and the Small-Pox and Scurvy, some Hemorrh-

morrhagies; and in these the Pulse is small, quick, frequent, and weak.

In the inspissated Sizinens we use a cool Regimen, in the grumous Viscidity a hot Regimen, and hot Medicines to accelerate the Motion.

5. The Secretions are vitiated through want of a due Velocity in the Circulation, or by the Obstruction of the *Glands*, by the thick Humours: If the Blood moves too fast, the Secretions exceed as in *Choleras*, *Diarrheas*, *Diabetes*, &c. and then the Pulse becomes, after some continuance, slow, weak, and more rare; but at first 'tis great and quick, ás in Fevers, and strong, undose, in the beginning of the Flux: If the Perspiration be stop'd in healthful Blood, it makes a *Plethora*, and a great Heat, and quick Circulation, as in all Obstructions of the natural Secretions; in hot Tempers, if the Perspiration be stop'd, a putrid Fever, Inflammation, or Defluxion arises: If the Perspiration be too much, a Syncope will happen, and a Consumption, and the Pulse will become slow and rare, and that slow Circulation disposes to Cachexies.

6. The circulating Humours may be extravasated, if mov'd too fast, as in Hemorrhagies, and Ruptures of the Vessels;

or else they pass the *Glands* like a Defluxion, or else by Stagnation they corrode their Vessels in empuemas Wounds, Ulcers, Contusions, Aneurisms; in all these Cases the Humours are produc'd by a quick Circulation; but in Dropsies the fulness of Humours distends, and breaks the *Lymphatics*, and before the Rupture the slow Circulation is the occasion of the Stagnation of Humours.

7. The Ebullition *Ζεοίς* or *Ζυμώσις* of Humours has always a feverish, quick Circulation, and the Pulse is great, quick and frequent; but the several Types of the Fevers depend on the Cacochymia, which vitiates the Blood; the Ebullition depends on a Ferment, which alters the *Crasis* of the Blood to a turbid State, and the greatest confusion or separation of Parts produces a Putrifaction; the Milk drove from the Breasts is the Ferment, in a Milk Fever, the suppression of the *Lochia* produces the febris *Purpurata*; all inward Abscesses produce a Hectic, a suppression of seminal Lympha produces the febris *alba*; the stoppage of Perspiration produces a catarrhal Fever, and Ephemeras and Defluxions, as Coughs, Asthma, Gout, from the crude Chyle in the Blood a *Quotidian*; if the Blood be tinctur'd with Chol-

ler a *Tertian*, if with vitriolic Acid the Fever is a *Quartan*; in a malignant Fever the Animal Spirits are oppress'd by a viscid Blood and Chyle; in the Itch and Leprosy, Hydrophobia, the Blood is putrify'd by an external Poison insinuated thro' the Skin; the pestilential Air occasions Fevers by a *Fætor*, which infects our Humours. In all these Cases the Mixture and natural Ebullition of the Blood is alter'd by a corrupt Ferment which rarifies the Blood and Spirits, and accelerates the Pulse and Circulation, which makes the Pulse quick.

In all *Effervescencies* of Humours by external Causes, as Fire, Sun, Exercise, hot Baths; the Blood moves too fast.

8. The *Crisis* of the Blood is dissolv'd by Fusion, when the Serum separates from the viscid Cake for want of a natural Velocity in the Circulation; this happens when it is stop'd too long by external Cold, and in Cachexies, Dropsies, Cold, Catarrhs, old Gouts, cold Tempers, old Age; in all these the Pulse is too slow, and a Circulation too slow depraves the Secretions, as well as when 'tis too quick.

9. The Blood is deprav'd by its mixture with ill Chyle; if it be Bitter, Salt, or

Vitriolic, the Circulation and Pulse is too quick; if the Chyle be Slimy, Watery, or *Acerbe*, the Pulse and Circulation runs slower after Eating; if the Chyle be of a sweet Taste, 'tis well prepar'd, and the Pulse and Circulation runs moderately.

The Ferment of the Stomach digests the Chyle too much into a nidorose State, when 'tis tinctur'd with Choler, salt *Serum*, or a vitriolic Humour, and then the Pulse and Circulation runs too high, and frequent; but if the Ferment be Slimy, Watery, or *Acerbe*, the Circulation runs too low, and the Digestion is crude, or too low, like Immaturity in Fruits; in the former Case there is a Fever, in this a Coldness and Heaviness in the Stomach; in the Nidor of the Stomach there are hot Winds, in the cold Stomach cold Winds. All our Winds must differ according to the Humour, which is rarify'd into Wind. The Pulse will shew the *Cacochymia* which affects the Stomach; the hot by the exceeding, and the cold *Cacochymias* by the deficient Pulses, which will always shew the crudity of Digestion; acrid Salts, or bitter and fætid Chyle, will irritate the Organs of Circulation much.



The quantity of the Chyle makes a *Plethora*, and a full Pulse, the deficiency of it a soft Pulse.

The fizeiness of Chyle depends on an exceeding Pulse, the crudity and mucilaginous Gummosity on a deficient Pulse.

The motion of the Chyle is obstructed by a fizy Viscidity in exceeding Pulses, or by a cool Mucilage, when the Pulse is deficient; the Inspiration and Peristaltick Motion alter with the Pulse and Circulation.

The Chyle is preter-naturally evacuated by Stools, Urine, Salivation, *Fluor albus*, Sweating, Coughing; and this alters the Pulse as the Evacuations of the Blood do.

The qualities of the Chyle are alter'd by the several Cacochymias.

The Chyle is oft mix'd with Bile, salt *Serum*, the *Atrabilis*, or the lacteal Lympha, much Water, or Acerbity.

The Chyle mixes not well with the Blood, if it circulates too fast, as in Fevers, nor if it circulates too slow, as in Cachexies.

We know when the Relicks of the Chyle which are not sanguify'd are not excreted, or perspir'd by the exceeding Pulses, which perspires and evaporates all the old Nutriment next Day.

Tho'

Tho' the Chyle move out of the Circle of the Blood, yet since it is produc'd by a Ferment, deriv'd from the Blood, it will have the same State as the Blood, and that may be discern'd by the Pulse.

I have reduc'd all the Faults or Diseases of the Blood to a Circulation running too fast, or too slow; and to the same I may refer the preter-natural State of the Animal Spirits.

1. The Spirits are vitiated by the cold Cacochymias, so in soporous Affections they are watry and crude, and slimy; in these the Circulation moves slowly, and the Pulse weak and rare.

2. The Spirits are vitiated by hot Fumes, or hot Winds in the *Atrabilis*, and *Deliriums*; or by Saltness in running Pains, or by Bitterness in *Deliriums*, and Head-Achs, and Watchings, in Passions, and *Manias*; the Spirits are too volatile, or over-rarify'd, and then the Pulse is too frequent, great and vibrating.

3. The consistence of the Lympha of the Nerves is too viscid in Palsies, Apoplexies, Lethargies; and then the Pulse is the same as in sily Blood, very exceeding; the *Lympha nervosa* is too thin in Heaviness, cold Catarrhs, and Dropsies of the Head.

4. The

4. The quantity of the Spirits exceeds in strong Pulses, they are defective in weak Pulses; and weak Circulation after great Fluxes, Labours, in Consumptions and crude Blood.

5. The motion of the Spirits is vitiated when they flow violently into a Part, in Inflations of the Guts, Membranes, *Uterus*, Tendons, *Catalepsis*, Stiffness; and Numbness is occasion'd by the compression of a Nerve; in the *Atrabilis*, or sify Blood, such convulsive Winds are produced, and the natural and mechanical motion of the Spirits depends on the Pulsation in the Brain, by which the Nerves are compress'd.

The natural propulsion of the Spirits is obstructed in Palsies, Syncopes, which make the Pulse rare and weak, because the undulation of the Spirits is hinder'd outwardly; and this is necessary to all Animal Motions, as well as the Circulation.

The undulation of the Spirits towards the Brain produces all our Sensations; and 'tis vitiated by the Obstructions of the Nerves in Blindness, and Deafness, want of Feeling; these depend not on the Circulation and Pulse, and cannot be known by it, but the *Cacochymias* or antecedent Causes may be known by the Pulse.

An easie undulation of Spirits produces Pleasure, an ungrateful Pain.

The motions of the Spirits is Tumultuous and Convulsive, when the Spirits are agitated by acrid, volatile Particles, which flow from the Blood with the *Serum* into the Nerves; these produce Giddiness in the Brain, and Convulsions, by irritating of the Nerves.

The inordinate irregular Motions of the Spirits produces incoherent *Ideas*; this Motion is caus'd by the hot, windy Caco-chymias, by hot Passions, or choleric and melancholic Fevers, and is known by exceeding Pulses; the *Vigiliæ* depend on an over-rarify'd Spirit, as well as a *Mania*, and Dreams depend on a great agitation of Spirits.

When much Blood is transferr'd to the Head, the Brain-Glands are oppress'd, and Efflux of Spirits is hinder'd, and the Nerves oppress'd as in Apoplexies.

Any agitation of the Spirits in any external Part is communicated to the whole nervous Fluid, and then Convulsions begin in some external Part.

6. If the Spirits are vitiated in their qualities by the several Caco-chymias, they produce different Diseases.

1. The *Atrabilis*, by a very great Heat produces the hysteric and hypochondriac Winds and Convulsions.

2. The salt Cacochymia produces the scorbutic wandring Pains.

3. The acrid Bile produces the Phrenetic and *Mania*.

4. A seminal Fœtor is mix'd with the Spirits in the *melancholia Virginum*.

5. A fermented Spirit is mix'd with the Animal Spirits in Ebriety.

6. Dark Fumes are mix'd with the Spirits from melancholic, putrid Blood, suppress'd in the obstruction of the Piles, and Menstrua.

7. An extraneous Ferment affects the Spirits in the hydrophobia Plague, and malignant Fevers and Poisons, by a volatile corrosive Salt, occasions *Deliriums* or Sleep, or great Evacuations, and corrode.

8. These Diseases of the Brain disturb the Motion, or hinder Influx or Undulation of the Spirits, Inflammations, Schirrus, Polypus, Imposthumes, Worms, Fractures, Concussions, Pains, Ulcers, depressions of the Skull, Dropsies.

9. These external Causes dissipate the Spirits, Labour, hot Baths, hot Air, Passions,

sions, or else they rarifie them too much; and these condense them, Grief, Sadness, and acid watery and slimy Diet.

10. The Spirits are encreas'd by a plentiful Diet, Joy, Rest, Sleep, fermented Liquors, Aromatics; in serene cool Air the Spirits are more Elastic, in cloudy and rainy Weather the Globuli of the Spirits are larger, and unfit for Motion; or the Glandules of the Brain are too much relax'd, and receive an impure *Serum* from the Blood; South Winds, and Fenny Habitations have the same Effects.

In a weak Tone of the Brain, and moist Tempers, the Lympha abounds too much.

Since the Animal Spirits, are the immediate Causes of the Pulse, all its Disorders, diseas'd States, Motions and Qualities will be discern'd by the Pulse; and the Circulation will be alter'd by those Diseases, or at least all the Diseases of the Bloods, Circulation will be communicated to the Spirits.

All Diseases alter, and hinder the Animal Actions; and since they depend on the Circulation (for when that stops, all Actions cease) if we preserve the Circulation, or cure its Excesses or Defects, we

re-

restore all the Animal Actions, and cure all Diseases in the Blood and Spirits, which are the antecedent Causes of all Diseases, as is above describ'd.

We not only discern by the Pulse the several ill States of the Blood and Spirits; but the Alterations of the circulatory Organs, which make intermitting or unequal irregular Pulses.

1. The Motion of the Spirits is obstructed by Tumors which compress the Nerves, or by Pains, Convulsions, which constrict the Nerves; so the Nerves are compressed in Apoplexies, Palsies, sleepy Diseases, or constricted in Epilepsies and Pains.

2. The Muscles of the Heart and their Motions, are alter'd by Tumors, Inflammations, Fat, Schirrus, Dropsies of the Breast, Empyema, Wounds, Ulcers, Worms, Palsie, Convulsions, Atrophy, weak Tone, these oppress and stop the Motion, or irritate some Palpitation, or relax and weaken the Fibres.

3. The Canals of the Circulation are obstructed by a Polypus, Varices, Stony, or bony Concretions in the Artery; or the Vessels may be contused, broke, as in Aneurisms, or distended, coroded, constricted, compressed.

4. The

4. The Respiration promotes the Reflux of the Blood ; and when Diseases affect the Lungs, the Pulse is soft and unequal, or intermits, and the Circulation goes slowly, the Lungs may be affected in their Air-Vessels, Blood-Vessels, Muscles, Nerves, or compressed by Tumors.

5. The Habit of the Body is lax and defective in its natural Tone and Spring, which occasions the Blood to stop ; and by Stagnation in the Extremities they swell, because the Muscles and Membranes do not sufficiently compress the Vessels, as oft as the Artery propels them, and thereby promote the Reflux of the Blood.

*The Method of Cure by the Pulse, more particularly describ'd.*

Our Health consists in the strength of the Animal Actions, and Diseases are alterations of those Actions ; and whatsoever alters those Actions is the Cause of the Disease.

The Circulation is the Original of all the Animal Actions in Health ; as that is alter'd so are the Actions, and as we restore the Circulation, we thereby help the Actions.

The



The Actions of the Animal Spirits depends on the Circulation of the Blood, if that move fast, our Passions are furious, our Motions are precipitate, and our Judgments rash, and the Imagination is delirious ; but if the Blood move too slow, our Senses are dull, the Imagination slow, the Judgment and Memory stupid and slow, and the Motions of the Body are sluggish and grave.

I have above shewn, That the Digestion alters with the hot or cold Cacoehymias, and consequently with the Circulation ; so that the natural and animal Actions depend on the Vital, that is, on the Circulation.

The distribution of the Chyle depends much on the Respiration, and that on the Pulse ; all muscular Motion depends on the animal Spirits, as they move down to the Muscles, and Sensation on their reflux ; 'tis the animal Humours which alter the Actions, and they are the antecedent cause of Diseases, as they are depriv'd by a high, or a slow Circulation.

In the best State of Health the Blood moves moderately, the Heat is moderate, and the Secretions are well perform'd ; the *Indicatio preservatoria* is to make such use of the *Non-Naturals*, as will keep the

Pulse and Circulation in a regular, moderate Motion; and to prevent or remove those Causes which in time would alter the Blood and Spirits, and thereby alter the Circulation and Pulse.

Since all Diseases may be reduc'd to an excessive quick, or too slow a Circulation, the cure of Diseases is to restore the Pulse to its natural State; and this is the *Indicatio Curatoria*, and there will be but two Methods of Cure in all Diseases, *viz.* to stop the swift Circulation in Fevers, Pains, Inflammations, Obstructions from sify Humours, Pleurifies, Peripneumonias, Rheumatisms, Hemorrhagies, Choleras, Putredos, Lassitude, Ephemeras, Abscesses, Convulsions, Deliria, Vertigo, Epilepsies, Palpitations, Cardialgias, Gout, Asthmas, Sciatica, Melancholia Hypochondriaca, and hysteric Vapors; and all hot Passions, hot Tumors, Erysipelas, Herpes, Leprosie, hot Winds.

The other Method of Cure requires the accelerating of the Pulse, as in Syncope, Dropsie, Cachexies, weak Digestion, pale Colours, Weakness, long Fluxes, cold Tumours, Cedematous, Schirous, Watry, Rigors, Tremors, Torpors, Stupors, immoderate Evacuations by Stool, Urine, Sweat, Hemorrhagies, Diabetes, Gonorrhoea,

rhea, *fluor Albus*, Vomiting, Lientery, Diarrhæa, *fluxus Hepaticus*, *Menstruorum*, and in soft, cold, Effeminate Skins, Comas. In the quick Pulse we cure by stopping; in the slow, by accelerating: And this is curing by Contraries, as well as in the common Method of Cure; the Pulse gives the general Indication and the principal. We consider the Humours as they retard or quicken the Pulse, and in the evacuating or altering of them, we are directed by the Pulse, as that shews the degree of the Disease, and the strength to bear it.

If we cure the several degrees or excesses of the Pulse and Circulation, the Humours will be rightly cured; and it will be the same thing, whether the Indications are taken from the Humours or the Pulse, but the last is most evident and certain.

The consideration of the Temperament, Age, Sex, time of the Year, Strength, Customs, shew whether we may use a stronger or a weaker Medicine.

The Nature of the Part, and external Causes co-indicate, or direct us about the use of the Remedy, in greater quantity and strength; but 'tis the Pulse alone that indicates the Method of Cure, and

the general quality or taste of the Medicine, which will alter the Pulse and Circulation to a contrary state; the Situation and Figure of the Part, indicates the manner of the Cure; therefore we may still take Coindications from the Part affected, its Substance, Conformation, Site, Figure, Actions, Excretions and other Qualities, and we must always preserve the natural state of our Pulse and Humours by the like; and restore the preternatural by Contraries, for till that is procured, the Disease is not cur'd; the Pulse will shew the Cacochymia in each Part, and the Rarification of the Animal Spirit, the hot or cold Intemperies of any Part (as the Old Physicians call it) without matter.

The greatness of a Disease is known by the Pulse's recess from its natural moderate Numbers, and by the injury the vital Faculty receives by it.

The greatness of the Strength is known by the Strength, Greatness and natural Numbers of the Pulse; if the Pulse be very distant from the natural, the Disease is great, and wants more vehement Medicines.

The Indication from the vital Faculty, is taken from the Pulse and Respiration; and

and by cordial and proper Diet we must support the Circulation.

When any Secretion is stopt, we find the Circulation irritated to a greater frequency; in this case we must mix both the hot and the cold Method; the hot opens the Obstruction; the cold Tempers, the frequency and celerity of the Circulations. In the Part obstructed the Circulation or Secretions is too slow, in other Parts the Circulation moves too fast, and must be checked by a cold Method.

The matter of our Medicines, we take from Diet, Pharmacy, Chirurgery.

When the Secretions and Evacuations exceed, we temper the Effervescencies of Humours by the cold Regimen, and accelerate the deficient Pulses and Circulation by the hot Method at last.

By the Pulse we know the antecedent Cause of the Disease, and the Actions injured by the Part affected; if we restore the natural Pulse, we cure the antecedent Cause of the Diseases; and if the Pulse exceeds, we use cool Topicks; if it be deficient, we use the hot Topicks to each Part.

*The Pulse will thus direct us in Bleeding and Purging, which are Remedies for fulness.*

In vehement and great Pulses we must Bleed, as in Fevers, Pains, Defluxions, Rheumatisms, Giddiness, Pleurifies, Quinsies, Phrensies, and all great Inflammations, and Intemperance in Diet. The florid Age, great Strength, and great Diseases have the same Pulse; and therefore do indicate Bleeding, because the fulness of Blood, or its great Rarification produce this sort of Pulse; and by the full distension of the Artery we know a *Plethora ad vasa*; and the same appears by the distension of the Veins; by an oppress'd Pulse we know the *Plenitude ad vires*; and there are great and small Pulses mix'd, and a lassitude is in the Limbs; the quality of the *Plethora* is known by the exceeding or deficient Pulses, as well as the Colour of the Face, and also by the Heat or Coldness to the Touch.

We must not Bleed in the deficient, weak and small Pulses; and the Pulse is unequal in Vehemence and Magnitude, when crude Humours abounds; in deficient Pulses the Circulation runs too slow, and the Digestion in the Stomach being too slow, it breeds crude Humours; in these

these Cafes we fupply the defects of Bleeding by Fasting, much Friction, Walking, hot Baths, hot difcuffing Unctions.

We muft Bleed, when by the Pulse we apprehend the approach of any great Difeaſes.

We Bleed in Fevers, and Spitting Blood, becauſe the Pulse is great, quick and frequent, and the Circulation runs too faſt.

In the Lienoſe we Bleed, becauſe the Blood is grumous, and moves little, tho' the Pulse is frequent, yet 'tis ſmall.

We find Obſtructions accelerate the Pulse, and for Obſtruction we Bleed to move the Stagnation, as well as to abate the ſwift Circulation.

By Bleeding in particular Parts we draw the Blood that way in the obſtruction of the Menſes and Hemorrhoids, we Bleed in the Foot, to accelerate the Pulse in thoſe Parts.

In the Pale Complexions, and in the Fat, where the Pulse runs deficient, we Bleed by Scarifying; but in the Lean and Black Complexions we find moſt viſcid Blood, and we Bleed by Lancet; in the Fat the Blood is thin and watry, and fitteſt for Scarifying.

In the Melancholic the Blood is thick, and makes an unequal Pulse; and an oppreſs'd Pulse if ſtrong, indicates Bleeding.

Where Bleeding is necessary, which appears by a frequent Pulse; and the Strength is weak, as appears by a small Pulse, and a weak one; we must Bleed by a little at a time, and repeat it two or three times; but where there is an extraordinary Effervescence of Blood in Fevers, or an Apoplexy threatens; we must Bleed, *ad animi deliquium*; and all that time we must feel the Pulse, and observe the Stream for fear of killing the Patient by excessive Bleeding, which plentiful Bleeding cools much, and produces Sweat and Stools. *Galen* in such Cases Bleeds sixty Ounces, which is near four Pound of Blood, and that is a 3d or 4th part of the Blood.

We judge of the quantity of the Blood to be lost by the Pulse; the greater the Pulse, and more frequent, the more Blood must be taken away; the softer and rarer, and more weak the Pulse, the less; *Galen* advises to consider the Age, the Strength, time of the Year, Diet, Excretion, in determining of the quantity; and these Things make the Pulse greater or smaller, rare or frequenter; therefore by the Pulse alone we may determine the *τὸ μέτρον* of Bleeding.



We Bleed the Lean, and those who have great Veins, more than the plump, and fat and pale Habits; because their Pulse is greater in the Lean, and softer and less in the Plump; soft Habits, perspire much, and have less Blood; we Bleed old Men and Children less, because their Pulse is small and weak, but in Quinsies, and great Inflammations; *Galen* Bleeds Youth of fourteen Years one *Cotyla*, that is, ten Ounces; and the highest Bleeding is six *Cotyla*, or sixty Ounces; the middle Bleeding to this Measure, is thirty Ounces.

In temperate Regions, and in the Spring we bleed most, because the Pulse is greatest in such Circumstances, and less in cold Seasons and Regions, such as is in *Muscovy*. In extream hot Regions, the Fevers are furious, and require great Bleeding, as in *Greece* and *Africa*; but where there are profuse Sweats for Preservation of Health, they Sweat most, and Bleed less.

A great and vehement Pulse are infallible signs of Strength, and if that continues so, we may repeat Venesection as long as the Disease requires. *Galen* says, he knew a Fever cur'd by Bleeding six Pounds of Blood without loss of Strength, *Chap. the 15th, de Venesectione: Galen*  
bled

bled for the Inflammation of the Eyes three Pound at first, and afterwards one Pound; and then he bathed in a tepid Bath, and anointed the Eyes. In the ἀπαλοσάρκοι, as *Galen* calls the *Celta*, he prescribes less Bleeding; and since our Country is moderately Cold, we must Bleed moderately, but in cold Seasons and cold Countries less.

If old Men and Children have great and vehement Pulses, we ought then to Bleed them, as well as the middle Ages; because they have a fulness of Blood, or great Rarification; and we Bleed more in the lean than plump Habits; we may generally Bleed the Young to ten, fifteen, or twenty Ounces; the middle Age to thirty, forty, or sixty Ounces, if the Pulse continue great and vehement; and we must observe the Colour, Stream and Pulse in Bleeding, and stop as the Colour changes, or the Stream falls, or as the Pulse alters. *Galen* affirms, That the πὸ πρὸν of Medicines, Diet, and Evacuati-  
 ons, cannot be certainly known, which makes Physick a conjectural Art; but if we consider the natural Pulse, we may say that there is a certain Rule for the quantity of Medicines, and Diet, which is this; we must use such quantity of Diet, Me-  
 dicines

dicines alterative, and Evacuations, as will reduce the Pulse to its natural Greatness and Strength; and the diseas'd Pulse will shew how far the excess or defect is by its Numbers from the natural Pulse, and Numbers in Health. Bleeding on the same side as an Obstruction happens in the Artery, empties the Veins on that side, and helps the stop'd Circulation. The Obstruction in the end of an Artery is help'd by Cupping, Scarifying, Fomentations, Unctions, Cataplasms, Plaisters.

Bleeding in the descending Veins reveals from the Head, as Bleeding in the Foot helps Hemorrhagies; and Bleeding in the Arms reveals the Circulation from the lower Parts, and stops the Flux of *Menstrua*, and Piles.

We derive or help the Circulation thro' the Head, by Bleeding in the Neck; and we Bleed the Splenetic, and all Inflammations on the same side.

In Diseases of the Lungs, Stomach, Liver, Spleen, we bleed in the Arm; but in those of the Belly, Hips, Kidneys, Womb, Arms, Mesentery, in the Legs, in the *Vena poplitis*, or *Malleoli*, in the Diseases of the Throat and Head, in the Jugulars; we Bleed three or four Days before the *Menses* to promote them; anciently

ently they scarify'd one Day one Leg, then the other, and gave Peny-royal, *Dictamnium*, or *Savin*, after Bathing in tepid Baths; Bleeding in *vena Poplitis* was observ'd to help the Sciatica more than Scarifying; in old Diseases we apply Cupping to the Part with Scarifications.

*Thus we may be directed by the Pulse in Purging.*

1. The Pulse shews what Cacochymia prevails, and we use the same kind of Purges in all those Diseases which depend on it, we use Chologogues for the Bile obstructed, in the Jaundice the same; we Purge in Erysipelas, Inflammations, Tertians, Gout; and we Vomit up the Bile in Summer, because then it is most bred; we use Melanogogues in Cancers, Elephantiasis, Melancholics, Quartans, Epilepsies, and in Autumn when the *Atrabilis* abounds.

We use Phlegmagogues in Anafarcas, Cachexies, Obstructions, Whites, cold Tumors.

We use Hydrogogues in Dropsies, Catarrhs, Scurvy, Gout, Stone, out of the Fits.

In serose Humours we evacuate in the beginning, because 'tis sufficiently fluxile; but the thickness of Phlegm, or the viscosity of Atrabilis wants a Dilution; and so do all fizy Humours want a Digestion, or Putrifaction, as well as adilution; and the fizy Humours must not be Purg'd till after twenty one Days, and by Digestives we help the Circulation in Phlegmatic Humours.

2. In the quick and frequent Pulse we Purge little, because Purging accelerates the Pulse, this makes Purging in Fevers dangerous; and in the beginning of great Inflammations, great Pains, and Defluxions; in hot times of the Year, and in dry Bodies, Purging is very injurious, and in all Effervescences of Humours, in hysteric and hypochondriac Vapors.

3. They who have a moderate Pulse, and plump Habit, are fittest for Purging.

The Sanguine are hot and humid, and have moderate Pulses, and bear Purging well.

The Phlegmatic have rare Pulses, and plump Bodies, and will bear the strongest Purges.

In the Winter the Pulse is most rare, and then we Purge downwards; the Fat, who have slow Pulses, bear Purging better

ter than the Lean, who have quick and frequent Pulses.

If the Air be hot, the Pulse is too frequent; if very cold, the Pulse is too rare; in the Spring the Pulse is moderate, as well as in Autumn, and then we Purge most safely.

4. In strong Pulses we may Purge with very strong Purges, but not when the Pulse is weak, and so it is in Vomits; but in frequent Pulses we may use gentle Vomits, in the beginning of Fevers; but in the Increase and State of Fevers we do not Purge, because the Pulse is very frequent; but in the Declination the Pulse is more moderate, and then we may Purge, because the Humours are made more Fluxile after their perfect Digestion; where no Coction is expected, we Purge at any time, as in serose Humours, and the rendering the Humours Fluxile is the best Preparation.

5. The more acrid any Purge is, the more it irritates the Guts, and circulatory Organs, and thereby promotes the Circulation; therefore these sharp Purges are only proper for cold Humours; and the Bitterish and Sub-acrid are most suitable to hot Tempers, because they disturb the Pulse least.

6. The

6. The quantity of Purging is known by excess or defects of the diseas'd Pulse, and by the quantity of the Cacochymia; the quality of the Cacochymia is also known by the Pulse. Thirst is accounted a sign that the Pulse has evacuated sufficiently, but the reducing the Pulse to its natural Number is the most certain Sign; for when the Pulse is return'd to that, we must neither Bleed, Purge, nor give any Medicines.

*Thus the Pulse will direct us in the use of Diuretics, Diaphoretics, and all Alteratives.*

In the use of *Diuretics*, if the Pulse runs to any exceeding Numbers, we must use the cool, watery, acid or terreous Tastes; if the Pulse runs in low Numbers, we must use the Tastes which are Acrid, Corrosive, Salt, Aromatic, for our Diuretics; but these are never proper in hot and dry Tempers, nor in Fevers, or exceeding Pulses.

In the use of *Diaphoretics* we must consider the Pulse; if it be too slow, we must use the hot, acrid, and bitter, Sudorifics; but if the Pulse runs too fast, we must mix Opiates with the Sudorifics to stop the  
the

the Pulse, and cold Water and cold Baths procure the Sweats in hot Tempers, and hot Seasons; the Pulse in Sweating must be undose, which is a Species of slow Pulses; neither a Pulse too frequent or too slow will produce Sweats.

In the choice of Baths the Pulse directs us thus, for a swift Circulation to use cold Baths, for a slow Pulse and Circulation to use tepid Baths; and we must continue our Sweats so long as the strength of the Pulse will bear.

In the use of Splenetics, Stomachics, Hepatics, Thoracics, Digestives, Cephalics, Uterines, we must chose those which are coolest in exceeding Pulses; and the hot Alteratives in deficient Pulses.

In the Preservation of Health, we chose the cold Regimen for exceeding Pulses, and the hot Regimen for the deficient.

The more exceeding the Pulse is, the cooler the Diet must be; and the slower the Pulse, the hotter the Diet must be.

No Diet, or the thinnest must be given in Paroxysmes, because the Pulse is then most frequent; and after Eating the Pulse is accelerated, but it is least disturb'd by cool and humid Diet; therefore this is most proper for exceeding Pulses.



We may know any Errors in Diet by the Pulse, which rises immediately after Eating, but is greater when the Chyle is distributed, and in Consumptive Cases is very great.

The lower the Pulse runs, the warmer must be the external Topicks; the more exceeding the Pulse is, the cooler must be all Topicks; and we must use *Narcotics* also to abate the Celerity of the Pulse.

Those Things which heat moderately ripen crude Humours, as warm Diet, moderate Friction, warm Cataplasms, warm Baths, or Perfusions; the Pulse is Feverish during Maturation, and it will bear neither very cold, which hardens the Tumor, nor very hot Topicks, which perspire thin Humours, and inflame the Part.

Then the Pulse will direct in prognosticating or undertaking any Disease.

Those Diseases are less dangerous to which the Constitution, the Age, the Habit of the Body is very subject, because the Pulse is alter'd from its natural State but a little in such Diseases; and where the numbers of the Pulse do stand near one another, those Diseases often change from one to the other; so a Pleurisie will turn into a Peripneumonia, an Ephemera

into an intermitting Fever, and into a Consumption, &c.

I will next propose the Method of judging of the Urine and Excrements by the Pulse; and of their Colours, Consistence, Sediments; and that they shew no more of a Disease than the Pulse can do, if it do not depend on the Disease of those particular Parts.

The διασφήματα shew the nature of the Concoction in the Stomach, and the Urine the healthful and diseas'd Sanguification of the Chyle, which is the second Concoction in the Veins; if the Pulse will shew the same Cacochymias as the Stools and Urine do, 'tis more agreeable to the Dignity of a Physician to neglect those common Signs, and to use his Skill in the Pulse instead of Inspection of Urines and Stools; the Pulse exceeding will shew the excess in Digestions in the Stomach, and Veins; and the deficient Pulses will shew the crudity or want of Concoction in both; and by the Cacochymia which the Pulse will indicate, we know the several degrees of Adustion or Crudity in our Humours, whether they be evacuated by Stools, Urine, Spit, or appears in the Skin of the Face and Body.

I will

I will here give a Parallel betwixt the several States of the Pulse, and the Colour, Consistence, and Sediment in the Urine, by which it will appear that we may know the State of the Urine by the Pulse, as to its Digestion, Colour, Sediment.

The healthful Urine is a little Yellow, of a moderate Consistence, and has a White equal (that is an undivuls'd) Sediment, proportionable to the Drink.

The Pulse shews the healthful State of all the Humours and Secretions when it stands at the healthful Numbers in a Morning, when the Urine ought always to be observ'd.

The Urine is too crude, or too much digested, and then has different Colours, Sediments, and Consistence; the crude State is known by deficient Pulses, and the over Digestion by the exceeding Pulses.

The watery part of the Urine is from the vehicule of the Chyle, the consistence of Urine, and the sediment *Nebula eneorema*, from the *succus Nutritius* dissolv'd in the Vehicule, the Colour from much or little Choler, or that which is under or over digested, the Salt from the *Serum* of the Blood.

The thin and pale white Water was call'd *λατὸν* or *ὠχρόν*, and by these we discern the Indigestion in the lowest degree, the pale wants the *succus Nutritius*, and the white Urine has a crude *succus Nutritius*, pale Urine is from Phlegm, and the thin from *Serum*.

In the crude State of Blood *Galen* places τὸ φλέγμα καὶ ἰχώρ, and after Blood, which is the most temperate Humour *Galen* places the εἰανθὴ χολή, and the μέλας χυμὸς produc'd by Heat; a Cloud in the top is a sign of a Crudity in some degree, but a Cloud in the middle is a sign of less Crudity, but the Sediment in the bottom is a sign of more Digestion.

A thin, pale Urine, can have no Sediment, because it wants chylose Matter.

Thick and white Urines are always crude Urines.

Women have paler Urine than Men, less in Substance, and have more Sediment, and so have Children; in these the Circulation is more rare, as well as the Pulse in phlegmatic Persons.

The Urine, with a little Sediment, and sometimes with none, is a sign of Indigestion, beginning in Fevers; a crude Humour makes a white Sediment, but 'tis unequal and divuls'd.

Dige-

Digestion begins with a Cloud, then an *εναπόρημα*, than an *υπόστασις*.

The best Urine has a moderate Consistence, and is from Blood well digested; the Crude has a thin Consistence, or a pale, thick; the over Digestion makes a thick and high colour'd Urine, Yellow, Lixival, or Black.

In pale Urine little Choler is mix'd with the Urine, the *πυρρόν*, or Gold Colour has more Choler, the *εξανθή* has a moderate Degree.

Pale and white Urines signifie weak Digestion, and weak Circulation, as deficient Pulses do; and they happen in old Men, and long Diseases.

In weak Constitutions, Obstructions, the beginning of Fevers in Children, much Drinking, Dropsies, Cachexies, Diabetes, Convulsions, and in all Diseases where the Circulation stops; and thereby makes a fusion of the *Serum* from the viscid Parts of the Blood, and in obstructions of Kidneys, in the Stone, or the obstruction of the Circulation thro' the Brain in malignant Fevers, or Abscesses; the *Serum* is pass'd by Urine, without much Salt, or Choler, or *saccus Nutritius*; and in Fevers, pale Urine prognosticates Phrensie or Death; the pale Urine is a sign of crude

*Serum*, the white of phlegmatic Humours, the *Rufa* or *Fulva* is almost perfectly digested; the High, Yellow, is a sign of much Cholera; the Red of great Inflammation or Saltness; the Black Urine, as well as the Yellow and Red, are signs of over Digestion; and since all these Cacochymias, whether hot or cold, are discernable by the Pulse, the inspection of Urine is not so necessary.

In Tertians, Watchings, great Passions the Urine is thin and yellow; the *succus Nutritivus* is wanting, but the Cholera abounds, and is vitelline.

The Urine is thick and black in melancholic Humours, after Quartans, and long Melancholics; the Livid is a degree towards Black, and is a sign of a Mortification.

Greasie Urine from the Colliquation of Fat, red from ferous Blood, milky from Chyle; slimy *Mucus*, or *Fluor Albus*; fætid Sediment signifies Putrification.

Troubled thick Urine, which remains so like that of Horses, is a sign of Head-ach, and great confusion of Humours thro' a violent Ebullition; but when the thick begins to subside, 'tis a sign of some Digestion, and separation in Fevers; they who have a *Crisis* on the 7th, have a red  
Cloud

Cloud on the 4th ; the watry Urine is a sign of an Abscess, if it continue long in Fevers.

A farimaceous Sediment is a sign of a long Fever, a Biliose of an acute Disease, and this is as well known by a slow and a quick Pulse.

The nearer the Pulse or Urine are to the Natural, the less is the Danger ; the watry or thick Black are dangerous, and the Fetid and Bloody.

In the watry Urine the Pulse is low, or Humours are fix'd in some part, and produce an Abscess ; but in the very high colour'd Urine the Pulse runs too quick, and the Fever has a *Crisis* by some Evacu-ations.

The Fetor in Urine is accompany'd by a quick Pulse, and both are signs of Putrification, Colliquation, Death, or Delirium.

*Galen* has well distinguish'd two sorts of black Humours, τὸ μέλαν ποτὲ ἐνδείκνυται ψύξιν ποτὲ ἢ θερμότητι ; and he says, when black Humours are produc'd by Cold, a Livid preceeds ; in this Case the Blood stagnates, and the Pulse is very rare ; but when the Black is produc'd by Heat or δια ὑπερόπτησιν, a yellow Colour in the Urine preceeds, and in this Case

the Pulse is extremely quick and frequent.

The Urine is thick and red in Fevers, but the quickness of the Pulse does as evidently discover a Fever, and the Aduſtion of Humours.

The Urine is Lixival in the ſaltneſs of Blood, and that Cacochymia is known by the frequency of the Pulse, and thin Habit of Body.

The furfuraceous, ſquammose, and furinaceous Sediments, are ſigns of the Conſumption of the Kidneys, if the Urine be well digeſted; or of the whole if there be a Fever, and that appears always in the Pulse.

Thick and pale Urine are ſigns of recovery in Fevers, and ſo are more ſlow Pulſes, the thin and black of Death; and theſe have weak and quick Pulſes.

All our Excretions, as well as the Urine, ſuch are Stools, Spits, Vomits, have their Colours from the Cacochymia; they are yellow from Bile, white from a phlegmatic Lympha, black from Atrabilis, cæruſinoſe from Choler and Salt mix'd.

Galen diſtinguiſhes ſpumofity of Humour thus, ὁ ἀφροὶ διαψέξιν, is indigeſted Humours only Air mix'd with them; but the τὸ ἀφρώδες διὰ δερμάτῳ is a ſign of



of Heat, and is like the Broth of boiling Water; this is known by the exceeding Pulses, and the former by the deficient.

*Galen* calls viscid or fizy Humours φλέγμα κατοπτηγόν, these Viscosities depend on Heat.

*Galen* derives the ceruginose Colour from the ὑπεροπθίσεως of the Serum.

C H A P. III.

*Containing the Tables.*

T A B. I.

*Containing the most healthful Numbers of Pulses in one Minute, according to the several Climates, which are distinguish'd by every Fifth Degree, betwixt the Æquator and the Northern Pole.*

| The Number of Pulses. | The Degrees from the Æquator.          |
|-----------------------|--|
| 120                   | This Number happens under the Æquator. |
| 115                   | Fifth Degree from the Æquator.         |
| 110                   | 10                                     |
| 105                   | 15                                     |
| 100                   | 20                                     |
| 95                    | 25                                     |
| 90                    | 30                                     |
| 85                    | 35                                     |
| 80                    | 40                                     |
| 75                    | 45                                     |
| 70                    | 50                                     |
| 65                    | 55                                     |
| 60                    | 60                                     |
| 55                    | 65                                     |
| 50                    | 70                                     |
| 45                    | 75                                     |
| 40                    | 80                                     |
| 35                    | 85                                     |
| 30                    | 90                                     |

*London*

The Ground on which I fram'd this Table was by observing that in *England*, the Pulse most naturally runs about 70, and this Kingdom is 50 Degrees or more from the *Æquator*; I distinguish'd the Degrees by the Number 5, for the more easie Calculation.

The different Manners of all Nations depends on the Pulse natural to each Climate; and that is produc'd by a particular hot or cold Diet, or Air, Exercise, and Passions peculiar to each Nation.

If we reflect on the general Pulses in the Climates above-mention'd, we shall find the Latitudes; the healthful Pulse run is from 30 to 120 in a Minute, and that Latitude is 90 Degrees from the *Æquator*.

In the 45th Degree the Pulse runs 75 Beats, and that Number must be esteem'd the most moderate and healthful Pulse, in respect of all the varieties which happen in the 90 Degrees from the *Æquator*.

Since *Great Britain* is plac'd in a Latitude from 50 at *London*, to 53 at *York*, to 56 at *Edenborough*, we must allow the natural and most healthful Pulse in *Great Britain* to run at 70 Beats; and I find by  
Expe-

Experience, that towards the Southern Parts, it will run more from 70 to 75; and in the Winter, and Northern Part of *Britain*, betwixt 70 and 65; so that from 75 to 65 may be a healthful Pulse.

The several times of the Year alter the Pulse in *England* from 70 in the Winter, to 75 or 80 in the Spring, in hot thin Tempers; and to 85 or 90 in Summer, or extream hot Weather.

The Cold in the Winter sinks the Pulse sometimes if extream 10 Beats, but Diet soon raises it; in Winter the Chyle is Pituitous or Crude, in Spring the Blood is rarify'd, in Summer much Bile is produc'd, and in Autumn the Melancholy, and these alter the Pulse.

All the Climates above 45 towards the *Æquator* have exceeding Pulses, and Cholerick thin Tempers and Habits; all the Climates from 45 to the Pole, are pituitous Tempers, and naturally plump Habits; and in *England* we may reckon ourselves in the first degree of pituitous Tempers, being next to the temperate Climate at 45 Degrees.

In the Fits of high Fevers I have found the Pulse at 120, but whether extream cold Air or Diseases will sink the Pulse to

30, I cannot yet discover; for I never yet observ'd it under 50, and rarely under 60 Beats in a Minute.

*Galen* usually calls the *Celta* ἀπαλοσαρχοὶ καὶ λευχοί, which he esteem'd a sign of a pituitous Temper in the *Celtick* Nations.

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T A B.

## T A B. II.

*Containing the Pulse according to the several Ages.*

I. **T**HE Pulses of Children under Seven Years old, *March 26, 1706.*

| Ages.   | Pulses in a Morning in one Minute. |
|---|------------------------------------|
| Three Years old a fair Boy with a moderate Habit.     | 93                                 |
| Five Years in a Girl of a thin Habit, and brown Hair. | 106                                |
| Six Years old a Girl subject to a Cough.              | 105                                |

*Note,* That the Reason why Children are more subject to Fevers and Passions than in other Ages, is the great frequency of their natural Pulse, which is near to the

the Number which shews a Fever; and by the frequency of their Pulse we discern the greatness of their innate Heat.

The *Chinese* do not observe the Pulses of Children under Five Years, but they judge of them by the common Signs of the *Cachymia*.

## II. The Pulses from 7 to 14.

|   |          |
|---|----------|
| A Boy above Seven<br>in <i>March</i> , and his<br>Pulse was the<br>same in <i>May</i> fol-<br>lowing. | 80       |
| A Boy of Eight<br>Years old in <i>March</i><br>and in <i>May</i>                                      | 82<br>86 |
| A Boy of Nine Years<br>old in <i>May</i> follow-<br>ing but 84.                                       | 94       |
| A Boy of Ten in<br><i>March</i>   | 85       |
| Another   | 80       |
| A Third   | 94       |
| A Fourth in <i>May</i>  | 80       |
| A Fifth in <i>May</i>   | 83       |
| A Sixth   |          |

|                           |    |
|---------------------------|----|
| A Sixth in <i>May</i>     | 94 |
| A Seventh in <i>March</i> | 90 |
| In <i>May</i> the same.   | 89 |

|                                  |     |
|----------------------------------|-----|
| Eleven Years old in <i>March</i> | 78  |
| The same Boy in <i>May</i>       | 100 |
| Another Boy in <i>March</i>      | 68  |
| Another in <i>March</i>          | 92  |
| The same in <i>May</i> .         | 89  |

I found these varieties of Pulses in a Boy of Eleven, 69, 70, 72, 76.

By this 'tis evident, That young Boys have a Latitude in their healthy Pulses.

A Child of Ten Years, after a Glass of Sack in a Morning had 90 Pulses.

|  |    |
|--|----|
| Twelve Years old                       |    |
| A Boy in <i>March</i>                  | 85 |
| Another in <i>March</i>                | 78 |
| In <i>May</i>                          | 90 |
| A Third in <i>March</i> and <i>May</i> | 73 |
| A Fourth in <i>May</i> .               | 95 |

|   |     |
|---|-----|
| Thirteen Years a Boy                    | 83  |
| A Second in <i>March</i> and <i>May</i> | 106 |
| Another                                 | 80  |
| Another in <i>March</i>                 | 84  |
| In <i>May</i>                           | 90  |
| Another                                 | 86  |

Fourteen



Fourteen Years old

|                         |     |
|-------------------------|-----|
| A Boy in <i>March</i>   | 102 |
| In <i>May</i>           | 100 |
| Another in <i>March</i> | 84  |
| In <i>May</i>           | 69  |
| Another in <i>May</i>   | 78  |
| Another                 | 86  |
| Another                 | 77  |
| Another                 | 84  |

III. The Pulses from 15 to 25, or 40.

Fifteen, a Boy in *March*

|                            |    |
|----------------------------|----|
| And the same in <i>May</i> | 70 |
| Another in <i>March</i>    | 98 |
| Another in <i>May</i>      | 76 |

Sixteen Years old

|                           |    |
|---------------------------|----|
| A Boy in <i>March</i>     | 81 |
| In <i>May</i>             | 77 |
| Another in <i>March</i>   | 98 |
| In <i>May</i>             | 80 |
| A Third in <i>March</i>   | 92 |
| A Fourth in <i>May</i>    | 77 |
| A Fifth Hypochondriac Boy | 97 |

Seventeen Years

|                     |    |
|---------------------|----|
| A Boy in <i>May</i> | 66 |
| Another             | 78 |

|   |    |
|---|----|
| Eighteen Years  |    |
| Some young Mens Pulses<br>in the Winter   | 72 |
| Twenty Years  | 76 |
| Twenty two Years very<br>healthful and good Habit,<br>and this Number happen'd<br>divers Mornings | 74 |
| Twenty three Years a young<br>Man   | 72 |
| Twenty four Years lean and<br>tall  | 70 |
| Twenty five a thin Man in<br><i>May</i>   | 80 |
| Thirty five a fat Man Hypo-<br>chondriac after Dinner, he<br>was 90 Beats                         | 66 |
| Forty, two Men of Forty<br>both lean  | 65 |
| Thirty two Years in <i>May</i> , this<br>was a fresh healthful Man of<br>a found Temper           | 83 |

#### IV. The Pulses of old Men and old Women.

|   |    |
|---|----|
| Sixty Years in a thoughtful,<br>temperate, but obstinate<br>Man | 60 |
|---|----|

Eighty, an old Man in a Morn- 60  
ing

This old Man drank Ale,  
and after Dinner had 105  
Pulses

Seventy, an old Woman in a 84  
Fever had Pulses

Seventy eight, an old Man in  
a Dropsie of the Breast and 78  
fat Habit

Ninety Years old he was very  
Hearty, and of a moderate 64  
Habit

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X 2 The

*The Pulses of divers old Women taken  
in the Morning Fasting, at the  
Hospital in Lichfield, in May.*

|         | Ages. | Pulses. |
|---------|-------|---------|
|         | 50    | 77      |
| Another | 50    | 86      |
|         | 60    | 80      |
|         | 71    | 76      |
|         | 72    | 77      |
|         | 77    | 75      |
|         | 80    | 68      |
|         | 81    | 75      |
|         | 83    | 84      |

*Note,* That the different Constitutions, and Diet and Passions, alter the Numbers to great varieties in all the Ages mention'd; the Pulse in most Old and Young runs alike very frequent, but in the middle Age the Pulse is more rare, as well as great and strong.

*The Pulses of young Females, and the older.*

A Girl of Nine Years, thin  
Habit, and fair Hair 84

Thirteen

|  |          |
|--|----------|
| Thirteen Years a Girl of a<br>thin Habit, brown Hair,<br>at other times 76 and 80 in<br>a Morning  | 75       |
| Fifteen, a fat sanguine Wo-<br>man in <i>May</i>   | 92       |
| Twenty two, a thin Woman<br>Consumptive  | 87       |
| Thirty, a Woman with yel-<br>low Hair, at other times<br>80  | 76       |
| Another Woman very health-<br>ful  | 73       |
| Forty Years a fat, fresh, fan-<br>guine Woman<br>In Winter, in <i>May</i>  | 64<br>79 |
| Fifty, a fat, fresh, sanguine<br>Woman   | 77       |
| Two Big-belly'd Women<br>had 80 Pulses in a Morn-<br>ing, and then had Girls.<br>Another Big-belly'd Woman<br>had in a Morning 94, and<br>after Dinner 110.<br>And a second had above<br>90 Pulses in a Morning,<br>and Girls. |          |
| But if any feverish Disorder<br>happens, that will deceive<br>me in Prognosticating.   |          |

I found the Pulse in a Big-belly'd Woman near Miscarriage 97

I observ'd the Pulse in the *Fluor Albus* 65, and during the *Catamenia* it runs low, under 70 ordinarily

*Note,* That the Pulse runs faster after Conception, and exceeds more after the Conception of Males.

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A Table

*A Table of the Pulses according to Diseases, and the Pre-Disposition to them by the several Caco-chymias.*

*The Number of Pulses.*

140. **T**HIS is the most exceeding Pulse, such as happens in Dying Persons, and 'tis usually call'd the formicant Pulse, which is very frequent and languid; and we find it in Fits of Fevers, or *Causus*; and in Childrens, whose Pulse are naturally very frequent; 140 is as many Pulses as can be counted in a Minute.

120. This Number the Pulse runs in ordinary Fevers; in hot Tempers I have counted in an Intermitting Fever oft above 100, and in hectic Fits I have counted 112 Pulses, 114, and 100 in a Morning commonly; the more frequent the Pulse of the Hectical is, the more is their danger; I have then counted 120 Beats.

100. This Pulse certainly shews a hectic Fever, the Pulse being small and frequent; and in a remis, intermitting Fever,

it stands much at this Number; but in some Hectics, whilst the *Tubercula* are crude, the Pulse is not much above 80; but as they imposthumate, the Numbers of the Pulse increases.

95. From this Number to 100, Asthmas, Catarrhs, Defluxions, Pains, Inflammations, Gout, Cholick, move the Pulse, in these Diseases; whilst the *Ephemera*, or continent Fever stands, the Pulse beats 100, and is great and vehement; but as these Diseases go off, it sinks towards 80 Pulsations; at these Numbers are diairy Fevers, and vapour Fits; in hot Tempers are diairy Fevers from Passions.

90. From 85 to 90, I place the *Atrabiliarian* Tempers and Diseases, which dispose to Vapors, hysteric and hypochondriac Fits, and *Deliria*; black Vomits, Spits, or black Urines or Stools, the Hæmorrhoids, hot Winds, bitter and acid Vomits, much Watching, much Thirst, the Cancer, Elephantiasis, Dysentery, Quartans, malignant Itching; they are of black Hair, and Lean; they have Biles, Morpheus, Scales, Schirrus, Convulsions; in all these the *Bilis Glasstea*, or *Atra* prevails, and the Pulse of Hypochondriacs runs betwixt 90 and 100; the livid  
Colour



Colour of Humours is a less degree of Black.

*Pulses from 80 to 85.*

I reckon the salt Cacochymia; this is the salt and bitterish State of Humours in the Scorbutic, which produces putrid Gums, pains in the Limbs, Formications, Lassitudes, Ulcers, Pustules, Herpes, Hæmorrhagies, Diarrheas, salt Rheums, falling of the Teeth, Spots and Scurfs in the Skin; they are subject to the Gout, Stone, Strangury, Æruginose Vomits from Æruginose Cholera, their Urines are Red, Lixivial; they are subject to Consumptions, Convulsions, Ulcers of the Kidneys, Cough, Leprosie; the Habit of the Body is thin and lean, there is a Fætor in the Mouth, Urine, Sweat.

*Pulses from 75 to 80.*

I place the bitter acrid Cholera, which is viscid and vitelline, which disposes to choleric Vomits, Choleras, Jaundice, Tertians, burning Fevers, Erysipelas, Thirst, want of Appetite; the Habit of the Body is fleshy, the Face sanguine and florid; they are of ready Wits, Bold, Boasting, the Pulse vehement.

*Pulses*

*Pulses from 70 to 75.*

All above 75 are exceeding Pulses, and hot Constitutions; all under 70 are the cold Tempers, and cold Diseases commonly call'd the Pituitous, and their Pulses are deficient; but betwixt 70 and 75 stands the most moderate healthful Pulse, and this State of Humours is best described by the sweetness of Humours; these Tempers are subject to a *Plethora*, Lassitude and Fevers, and Hæmorrhagies from fulness and sleepy Diseases; the Sweetness obscures the Acrimony of the secretitious Humours, and Tempers them.

*These are the sanguine Constitutions, their Faces are florid, and their Habits fleshy, the Skin soft, temperate and moist.*

*Pulses from 65 to 70.*

Are the sweet pituitous Tempers, their Habit is plump, and their Faces paler than the Sanguine, their Skin smooth and cool; these are subject to Quotidians, over-fat, they become Lethargic, Paralytic; they have, if Females, the *Fluor Albus*, and become cachectic Oedematous.

I have

I have observ'd after the Flux of the *Menstrua*, and after Lying-in 65 Beats, and that the Pulse was weak, slow, undose.

*Pulses from 60 to 65.*

Here I place the watry or serous Temper, or *Cacochymia*; these are subject to *Dropsies*, and watry Tumors in the Legs, Face, Head, &c. have weak Stomachs, dull Senses; this is the insipid *Pituita*; they produce *Catarrhs*, the Urine pale.

*Pulses from 55 to 60.*

This is the *Acerbe Pituita* in the cold *Melancholics*; these have much Fear and Sadness, they are cold in their Extremities, their Faces livid as in old Age, their Blood Stagnates, and their Pulses are slow; their Phlegm vitreous, which cause Gripes, cold Winds, sour *Ructus*, swell'd Spleen, Binding of the Body, much Spitting, Noise in their Ears, tensive Pains from Wind, Oscitation, Pandiculation from Stagnation of Blood.

By Analogy to the hot Pulses, I might place here two Diseases below the cold *Cacochymias*, as the hot Diseases are above the hot *Cacochymias*.

*Pulses*

*Pulses from 50 to 55.*

The undose, weak Pulse, after great Evacuations without a Fever, as Hæmorrhagies, Diarrheas, Sweats, Diabetes.

*Pulses from 45 to 50.*

An intermitting Pulse is referrible to the rare Pulses, and is usual in old Men, and some particular Constitutions, and probably is at these Numbers.

*Pulses from 45 to 40.*

Here by Analogy I conjecture the dying Pulse may be plac'd, which is call'd the vermicular Pulse; but I must confess that I want a full Experience in these low Pulses, because I have not yet found any Pulse lower than 55 Beats in a Minute, and the Pulse rarely is found under 60; therefore I must appeal to a farther Experience as to all Pulses under 60, and I cannot positively assert any thing concerning them.

*A Table of the Morning Pulses in several Months, as they vary, with a Comparison betwixt the Pulses, and Barometer and Thermometer.*

| The Day,<br>New Moon. | The<br>Pulses. | Barometer.                                      | Thermometer.              |
|-----------------------|----------------|---|---------------------------|
| Jan. 3                | 86             | 2deg. below R.                                  | 1 deg. above F.           |
| 4                     | 82             | 2deg. above R.                                  | at Frost.                 |
| 5                     | 86             | 2deg. und. Ch.                                  | 2deg. above H. F.         |
| 7                     | 92             | 1deg. und. Ch.<br>Snow.                         | 1 degree under<br>Frost.  |
| 8                     | 82             | At Chang.<br>Snow N. W.                         | 3 deg. above G.<br>Frost. |
| 10                    | 82             | 1 deg. ab. Ch.<br>Snow N. W.                    | 3 degree under<br>G. F.   |
| 11                    | 95             | 1 deg. ab. Ch.                                  | at H. F.                  |
| 12                    | 76             | at Chang.                                       | 5 deg. und. H. F.         |
| 13                    | 84             | at Ch.  | 5 deg. und. H. F.         |
| 14                    | 84             | 3 deg. below<br>Chang.                          | 5 deg. und. H. F.         |
| 18                    | 86             | 1deg. above R.                                  | 3 deg. above F.           |
| Full Moon. 19         | 77             | at R. full Moon                                 | at F.                     |
| 20                    | 85             | 1deg. above R.                                  | 3 deg. und. Cold          |
| 21                    | 90             | 1deg. above R.<br>Foggy.                        | 5deg. above H. F.         |
| 22                    | 90             | 1 deg. und. R.                                  | 5deg. above H. F.         |
| 23                    | 83             | 1deg. above R.<br>Frost N. E.<br>a little Snow. | 5deg. above H. F.         |
| 24                    | 82             | 2deg. under R.                                  | 5deg. above H. F.         |
| 25                    | 105            | 5 deg. above<br>M. R. a fe-<br>verish Cold.     | at Cold.                  |
| 28                    | 97             | Betwixt R. and<br>M. R. much<br>Rain.           | near C.                   |
| 29                    | 81             | 1deg. above R.<br>clear N. W.                   | near C.                   |
| 31                    | 83             | 1deg. above R.                                  | above C. 2 deg.           |

In *February* the Pulses run thus.

New Moon.

|    |     |  |
|----|-----|--|
| 2  | 96  |  |
| 3  | 86  |  |
| 4  | 100 | Feverish.                                    |
| 5  | 86  |  |
| 6  | 100 | Feverish.                                    |
| 7  | 91  |  |
| 8  | 83  |  |
| 9  | 95  | Asthmatic.                                   |
| 10 | 86  |  |
| 11 | 92  |  |
| 12 | 90  |  |
| 13 | 84  |  |
| 14 | 72  |  |
| 15 | 76  | This is the<br>healthful na-<br>tural Pulse. |
| 16 | 78  |  |

Pulses

Pulses in *March*, New Moon.

|    | Barometer. | Thermometer.                    |
|----|------------|---------------------------------|
| 1  | 84         | 1 deg. und. Ch. under C.        |
| 5  | 75         | 1 deg. und. Ch. 5 deg. under C. |
| 6  | 72         | 2 deg. und. Ch. at C.           |
| 7  | 74         | at R. 2 deg. under T.           |
| 8  | 80         | near R. 2 deg. under C.         |
| 9  | 74         | 1 deg. above R. 2 deg. above C. |
| 10 | 84         | 1 deg. und. Ch. 3 deg. above F. |
| 12 | 79         | 1 deg. under R. 7 deg. below C. |
| 20 | 70         |                                 |
| 22 | 76         |                                 |
| 23 | 71         |                                 |
| 26 | 72         |                                 |

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Pulses in April.

|    |    |
|----|----|
| 2  | 76 |
| 9  | 77 |
| 11 | 86 |
| 12 | 78 |
| 16 | 71 |
| 17 | 76 |
| 20 | 74 |

Pulses in May.

|    |    |
|----|----|
| 4  | 80 |
| 5  | 85 |
| 6  | 75 |
| 7  | 75 |
| 8  | 80 |
| 9  | 84 |
| 13 | 82 |
| 14 | 80 |
| 26 | 82 |
| 27 | 84 |
| 28 | 88 |
| 29 | 78 |



Pulses in June.

Barometer.      Thermometer.

|      |    |                  |                   |
|------|----|------------------|-------------------|
| 5    | 75 | 3 deg. above Ch. | at T.             |
| 6    | 72 | the same.        | the same.         |
| <br> |    |                  |                   |
| 8    | 78 |                  |                   |
| 9    | 81 | at R.            | 5 deg. und. warm. |
| 10   | 83 | at R.            | at T.             |
| 11   | 70 |                  |                   |
| 12   | 87 | at R.            | at T.             |
| 13   | 80 | 2 deg. above R.  | 2 deg. under W.   |
| 14   | 77 | 1 deg. above R.  | 5 deg. under H.   |
| 27   | 77 | at R.            | 5 deg. under T.   |

Note, That June was Cold and Rainy after the Full Moon.

I observ'd, That the 19th of *November*, Full Moon, the *Barometer* sunk to the bottom, it Rain'd and Snow'd.

The Pulse was 76, and the 20th 76, 21st 66, 22d 76, 23d 70, 24th 76, 25th 78; all these Pulses happen'd whilst the *Barometer* stood low, and the *Thermometer* likewise low; but as both rose, the Pulse came to 80, 82; but whether I may assert any thing positively, that it will always happen so, I must leave to farther Experiment.

The hot Tempers, and hot Pulses have the several Variations noted in the several Months; but if a Catalogue had been kept of any Pulse in a cold Constitution, or subject to deficient Pulses, and cold Diseases, the Numbers would have been very different.

In the Month above-mention'd these Observations I made, That in *November* I found the Pulse to run betwixt 70 and 80 for the most part; in *December* the Pulse did run for the most part above 80, and so it continu'd till the middle of *February*; in *March* the Pulse runs much betwixt 70 and 80, as it did in *November*, and the same Pulse was continu'd in *April*; but in *May* the Pulse rises, and runs about 80 or above;

above; by this Observation 'tis evident, That the Pulse rises both in hot and cold Air, and Seasons, among us; and that in *April*, and any temperate Weather or Season, the Pulse runs most naturally betwixt 70 and 80; and I must observe, That the last Winter was open, and warm, and the Spring forward, and the Weather has an influence on the Pulse, tho' 'tis difficult to observe it.

I may observe next, That in old Persons, cold Tempers, and cold Diseases, when the Pulse stands at 60, then ten Pulses will be wanting to the Variations in hot and cold Seasons; in the several parts of the Year, in *May* and *June*, I have observ'd some old Mens Pulses at 64, others at 70, or 75, in very hot Weather, and hot Diseases.

I have not try'd the Pulse in extream cold Winters, but may suppose that will sink the Pulse lower than ever I have found it, which seldom runs under 60 Beats in a Minute.

I took the Pulse of 13 Alms-Men in the latter end of *May*, some were 91, but the most about 80.

I have found the Pulses of some young Men about 60, and then it Beats strong, and this Constitution is a sign of long

Life; in these Constitutions the Pulse must stand lower in hot Seasons, and the other changes of the Year.

In *November* the Pulse of a healthful young Man was 70, of a young Woman 69 in a Morning.

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*A Table of the Cold Diet from Vegetables.*

1 **A** Mealy Diet, such as is made of Corn, Rice, not fermented as Water-gruel; Rice or Barley-broth, boil'd Wheat or Rice, Oat-cakes, Puddings, Bread dip'd in Water to wash out the ferment.

2. All sweet sub-acid Fruits, as Strawberries, Apples, Pears, Plumbs, Cherries, Apricocks, Peaches, Raifins, Figs.

3. The sweet Oily Diet of Almonds, Nuts, Emulfions, Oil-Olive.

4. The sweet slimy Fruits or Salads, as Melons, Gourds, Cowcumbers; these have a cool Slime, Purslain, Lettice, Spinage, Borrage, &c. young Nettles made in Thea are crude in Taste like a green Pea, and thereby it cools hot Bloods.

5. The

5. The acid Salads, or Pot-herbs, Sorrel, Dock-leaves, red Shancks, Barbery-leaves; and all acid Liquors, as Verjuce, and Water made into Posset-drink, or Syrup of Verjuce and Water, Cyder and Water.

6. The Stiptick Tastes, *Acerbes*, Quinces, Sloes, Crabs, Medlars, Cervices, Barberies, Cornelian Cherries, Cranberries; all have an Acerbity.

7. Water-drinking, Infusions of Liquorish, Decoctions of the Woods, Small-beer, Wine and Water, Toast and Water; all sort of Theas, as Sage, Rosemary, Bohe.

These Tastes are in the cold Diet from Animals.

1. The sweet Milky Diet, Asses, Womens, and Mares-milk, and Goats, Milk-Pottage, Milk and Bohe-Thea, Milk and Water for Drink.

2. The sub-acid Diet of Butter-milk.

3. The ferous Diet of Broths, Whey, still'd Milks, Posset-drinks, Milk and Water, Butter-milk, Posset-drink.

4. The mucilaginous Diet of young Animals, Fish, Eggs dissolv'd in Water, either Whites or Yolks, decoct of Snails, Ivory, Isinglass.

5. The Moorish crude Diet of Water, Fowls, Swans, Ducks, Teal, Wood-cocks, Snipes.

6. The fat Diet of Butter, Suet.

7. Raw Gravies, Meat Raw, Roasted, or Boil'd; and all Meats eat Cold.

*A Table of the hot Diet from Vegetables, which are distinguish'd by their Tastes.*

1. **O**F Acrids, as Mustard or Scurvy-Grass-Ale, boil'd Turnips, and Cabbage, Cresses, Horse-radish-root; all these have hot burning Tastes.

2. The corrosive Acrids as Garlick, Onions, Leeks, Chives, Mushrooms; these Tastes are more hot and burning, and Inflamm the Blood more.

3. The Acrid Aromatics, as Ginger, Nutmegs, Cinnamon, Clove, Fennel, Seleri, Parsley, Parsnep, Vaynillyos in Chocolate; all these evidently Heat and Inflamm.

4. The sweet pungent Diet of fermented Liquors, Wine, Ale, Metheglin, Brandy; these evidently ferment our Bloods, and are pungent; if much Bottl'd, Honey drinks Heat much.

5. The

5. The bitter Diet, strong hop'd Drinks, Wormwood, Beer, Mum, Ratafia Waters, bitter Almonds, and all Kernels of the same kind; Orange and Lemmon-peals; all Peas and Beans are bitterish if old; two Dishes of Coffee will raise the Pulse seven or eight Beats in hot Constitutions.

6. Custom has made Tobacco part of our Diet, and that inflames the Blood and Spirits by its actual Heat, one Pipe raises the Pulse five Beats in a Morning in one Minute; roast and broil'd Meats are hot from actual Fire in them, and so are all hot Theas and Chocolate, Pottage, warm Drinks.

These Tastes are in the hot Diet from Animals.

1. The salt Diet of salt Flesh or Fish, potted and smoak'd Meats, Bacon, Tongues, hung Beef.

2. The bitter acrid Diet of Livers, old Cheese, the Flesh of Bitterns is bitterish.

3. The high fatid Diet of Herrings, Salt-Fish, Salmon, Lobsters, Oysters, Crabs, and putrid Meats, Eggs, hunted Venison, Stale Meats, Viper Broths, or Wine.

4. The dry Diet of Birds, who feed on Seeds or Worms.

5. Broil'd, fry'd, bak'd Meats, dry, roasted and smoak'd Meats.

I have here plac'd these Tables of Diet, That every Person might discern what is a hot or cold Diet, and so chuse that which is proper to his Constitution and Pulse.

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*The English Physician's Cabinet, divided into Drawers, according to the several Physical-Tastes in general; and each Drawer is sub-divided according to the several Species comprehended under the general Taste, and the cheapest and most effectual must be chose for his Practice.*

*I. Drawer of Astringents.*

1. **T**HE Earthy Stipticks, as Coral, Coralline, and Green-Mofs, Cup-Mofs, Oak-Mofs.

2. The Acerbes, Plantain, House-Leek, Juice of Acacia, Omphacium.

3. The Aufteres, Oak-Bark, Galls, Biftort-Roots, Terra Japanica.

4. Aromatick Stipticks, Roses, Spongia Cynosbati, Radix, Rhodiæ, Saunders.

*II. Drawer of Acids.*

1. Tartar Acids, *Cremor Tartari*, Syrup Acetofellæ, Syrup Lemon, Lime-Juice, Juice of Citrons.

2. Vinose Acids, Syrup of Vinegar, or Syrup of Verjuice.

*III. Drawer*

III. *Drawer of Mucilages.*

1. The slimy Farina of Linseed, Starch, and all Meals.
2. Watery Gums, Gum Arabic, Tragacanth, Althea Roots, Elm-Bark.
3. Sweet Oily Mucilages, Oil of Almonds, Walnuts, Linseed.

IV. *Drawer of Sweet Tastes.*

1. The Leguminous Sweets, as Liquorish.
2. The Nauseous Sweets, Sena, Linum, Catharticum.
3. The Stiptick Sweets, Fern-Roots.
4. The sweet Fruits, as Figs, Dates.

V. *Drawer of Bitters.*

1. The smoaky Bitters, Cichory, Carduus.
2. The *Lamium* Bitters, *Hedera Terrestris*, *Scorodonia Galeopsis*, *Marrubium*.
3. The Wormwood Bitters, *Absynthium*, *Flor. chamoneli*.
4. The bitterish Stipticks, *Terebinthinales*, Bals. Peru, Tolu, *Gileadense*, *Summitat. Pini*, *Hypericum*.

5. The

5. The bitter nauseous Vomits, *Vinum Saylliticum*.

6. The bitter sweet Aloetics, *Scotch Pills*, *Ruffy Pills*, *Elixir proprietat. tartarifat.*

7. The nauseous bitter Stiptick, *Rhubarb*, *Dock-Roots*.

8. The nauseous Rose-bitters, *Damask Roses* dry'd to infuse in Water.

9. The nauseous Elder Bitters, *Dwarf Elder Roots*, *Syrup of Buckthorn*.

10. The nauseous and *Convolvulus* Bitters, *Briony*, *Jalop*, *Hypocacuanhay*.

11. The bitter sweet *Lychni*, *Gentian*, *Centaury*, *Buckbean*.

12. The Laurel Bitters, *green Walnuts*, *Syr. of Peaches*.

13. The odoriferous Laurels, *Lign. Aloes*, *Cinnamon*, *Cortex*, *Winteranus*, *Bayberries*, *Orange Pills*.

14. The acrid Laurels, *Guaicum*, *Gum*, *Guaicum*, *Bals. polycrestum*.

15. The bitter Stiptick, *Febrifuges*, *Cortex peruvianus*, *Cortex cerasorium nigr.*

16. Bitter Gums, *Myrrh*, *Olibanum*, *Mastick*, *Turpentine*, *Burgundy Pitch*, *Tarr*.

17. The bitter Stipticks, *Vulnerairy*, *Veronica*, *Bugula*, *Scabiose*, *Agrimony*.

18. The bitter sweet nauseous of the *Melon-kind*, *Trochisci alhandal*, *Elaterium*.

19. The

19. The bitterish sweet astringent Mad-  
ders, *Rubia*, *Gallium*, *Chelidon majus*, *An-  
chusa*.

VI. Drawer of Aromatics.

1. The sweet Aromatics, Fennil, Ani-  
seed, Caraway, Parsely Seeds.

2. The sweet Terebinthines, *Calamus*,  
*Aromaticus*, *Cyperus*, *Juniper*.

3. The fervid Aromatics, *Iris*, *Carda-  
momum*, *Cubeb*.

4. The bitterish Acrids, Aromatics, *Spir.*  
*Flor. Rosismarini*, *Spir. Lavendula*, *Sal vo-  
latile oleosum*, *Spir. hormini*, *Spir. thymi*,  
*Pulegium*, *Salvia*, *Rosmarinus*.

5. The Mint Aromatics, *Spir.* of Mint,  
Roots of *Dictamnus*, Mint Water Sim-  
ple.

6. Odoriferous Gums or Rosins, Benja-  
min, *Styrax*, Flowers of Ben.

VII. Drawer of Acrids.

1. The Cresse Tastes, Mustard-Seed,  
*Spirit of Scurvy-Grass*.

2. Acrid Turpentine, *Conyza*, *Enula*,  
*Campana*, Roots of *Potestis*.

3. Acrid Gums, *Ammoniacum*, *Galba-  
num*, Camphir.

VIII. Drawer

VIII. *Drawer of Fetids.*

1. Opiates, Poppy-Seed, and Heads, *Diacodium*, *Laudanum liquidum*.
2. Fætid Gums, *Assa fætida*.
3. Fætid Plants, Peony, *Vulvaria*, *Savin*, *Arbor Vita*.

IX. *Drawer of Corrosives.*

1. The mucilaginous Acrids, Garlick, Onions.
2. The watery Corrosives, distill'd Water from *Ranunculus Aquaticus* for a Vomit, *Aron*, Dragon-Roots.
3. The Terebinthinate Acrids, *Persicaria acris*, Oil of Turpentine.
4. The Tithymaline Corrosives, *Guttu gamba*, *Euphorbinum*.
5. The nauseous fætid Corrosives, black *Hellebor*.
6. The burning *Diuretics*, as Nettle-Seeds and Hemp-Seeds.
7. The mealy Acrids, as *Sarsaparilla*.

X. *Drawer, containing some Preparations from Vegetables, by Chymistry.*

1. Salts or Ashes, or *Sapo Castiliensis*, or the *Lixivia*.
2. Chy-

2. Chymical Oils, Oil of Aniseeds, Juniper, Nutmegs.

3. Volatile Salts or Flowers, Flowers, Benjamin.

4. Salso Acids, *Tartar vitriolatum*.

5. Chymical Tinctures, *Tinct. salis Tartari*.

6. Acids or Vinegars, *Acetum Theriacale*.

XI. Drawer, containing the Animal Medicines.

1. The Animal Stones, Bezoar Stones, Goa Stones, Pearls, Bones.

2. Mucilaginous Parts, Horns, Pisses, Teeth, Isinglass.

3. Bitters, Tinctures of Galls, Eeles, Livers and Frogs.

4. Caustic Tastes, Bees, Cantharides, Woodlice.

5. Salso Acids, Urine, Sal armoniac.

6. Fatids, Viper Powder, or Viper Wine, Bores Stones, Worms.

7. The odoriferous Civet, Musk.

8. The ferous Tastes, distill'd Milk.

9. The unctuous Tastes, Butter, and the Axungias and Fats, *Sperma Ceti*.

The sweet Tastes are commonly met with, and need not be preserv'd, as Milk, Broths, &c.

10. The

10. The Chymical Principles from Animals are volatile Salts, and Oils and Ashes of Animals.

XII. *Drawer, containing the Mineral Medicines.*

1. Stiptick Earths, Bole, Raddle.
2. Gritty Tastes, Chalk, Marble.
3. Acid Spirit of Sulphur, Salt, Niter, Vitriol.
4. Salso Acids, volatile Salt, or fix'd Vitriolate, *Sal Catharticum* is a nauseous, bitterish, Salso Acid.
5. Vitriolics, as Alom, Mercurial, Martial, Stipticks, Saturnine, Vitriols, Venereal, Jovial Stipticks; the Lunar Stipticks are bitterish, acrid Vitriols, Solar, sweet Stipticks.
6. Fætid smells of Sulphur, Antimony, Arsenic.
7. Fragrant Smells, as Ambergrise, Amber, *Petroleum*, which are *Bitumens*.
8. The Calces of Stones or Minerals, which are Stiptick.
9. Caustics, Arsenixs, *Lunar Causticus*, Oil of Antimony.

I have made this Scheme of a Cabinet for *European Medicines*, to shew they are  
suf.

sufficient for our purpose, as well as the *Chinese* Simples serve the Cure of their Pulses, when preternatural; and the exceeding Pulses will require the cool Tastes, and the deficient Pulses indicate the hot Tastes; and by this Method we shall imitate the *Chinese* Practice. 'Tis certain, their Experience of this Practice for 4000 Years is much to be valu'd, because they are an Ingenious Nation; but we have at present an obscure Account of it from the *Missionaries*, who know nothing of this Art; neither can they dexterously distinguish and separate the *Chinese* Notions from Matters of Fact, and the real *Phenomena*, to which all Hypotheses are adapted, tho' they be very absurd; this must be the Business of some Physician who has learn'd the *Chinese* Language, and has long had a full Experience of the *Chinese* Method of Practice, that he may more clearly describe their Pulses, and accommodate them to the Names we use. The Ignorance of the *Europeans* in the Sphugmatic Science, together with the Hieroglyphick Mode of the *Chinese* Notions, has hitherto kept us from apprehending the Sense of what is writ by Dr. *Andrews Cleyer*, whose Book fell into my Hands since I writ these Papers; and  
when



when I had read it, I found I could apprehend the true Sense of it ; and to gratifie the Curiosity of Ingenious Inquirers, I made the following Extract, and I suppose my Readers will be pleas'd to Practise according to the *Chinese* Mode, as well as to adorn their Houses with their curious Manufactures, and to use their Diet of Thea ; the *Chinese* are great admirers of the Antiquity of this Art, and when they mistake in their Predictions, they impute it to their own Ignorance, and not to any Defect in the Art.

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I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the above mentioned matter. I have the honor to inform you that the same has been forwarded to the proper authorities for their consideration. I have the honor to inform you that the same has been forwarded to the proper authorities for their consideration. I have the honor to inform you that the same has been forwarded to the proper authorities for their consideration.

I am, Sir, very respectfully,  
 Your obedient servant,  
 J. M. Smith

I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the above mentioned matter. I have the honor to inform you that the same has been forwarded to the proper authorities for their consideration. I have the honor to inform you that the same has been forwarded to the proper authorities for their consideration. I have the honor to inform you that the same has been forwarded to the proper authorities for their consideration.

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A N  
A P P E N D I X,  
CONTAINING

*An Extract of the Chinese  
Art of feeling the Pulse from  
Cleyer: In a Letter to the  
Honourable CHARLES  
HATTON.*

S I R,

I Am very much pleas'd with *Andrew  
Cleyer's* Book, which I lately bor-  
row'd of you, and I made the fol-  
lowing Extract out of it, which I  
am oblig'd to Present to you; not only  
as an Acknowledgment of the Favour  
you did me; but that I might procure

‘ some Respect to my Design (of explain-  
‘ ing the obscure Account of the *Chinese*  
‘ Art) by the great Esteem the Publick has  
‘ for your Learning and Judgment.

In Reading this Book, I reduc’d all my  
Observations to the following Heads.

1. The *Chinese* Directions for feeling of  
the Pulse.

2. The Mistakes of the *Chinese* in this  
Art.

3. The differences of the Pulse observ’d  
by the *Chinese*.

4. The Alterations of the Pulse by the  
*Non-Naturals*, and Diseases.

5. The Prognostications by the Pulse.

6. The Cure of the Preternatural Pulses  
by simple Medicines.

1. The *Chinese* direct the Physician to  
come to the Patient in the Morning to  
feel the Pulse, when he is Fasting; and  
the Physician ought to be Healthful, free  
from Cares.

After a little Quiet, they direct him to  
lay the left Hand on a Pillow, and to ap-  
ply the first Finger of the right Hand a-  
bove the Joint of the Hand and Wrist,  
and the second below the Bone, and the  
third

third below that, and afterwards to apply to the right Arm the Fingers of the left Hand; on the same manner they lay the Hand upwards, and sometimes downwards, in obscure Pulses.

The next thing the *Chinese* direct, is, To observe the three Places of the Pulse; three Places of the Pulse in the left, and the same in the right; and then to consider to what Members each Pulse answers, and to which Region of the Body, and then the Pulse must be examin'd in the Superfices, and middle, or deep, by a different Pressure.

We must next examine whether the Pulses be *Ad extra*, and depends on the *Calor primigenius*, that is, whether the Circulations runs thro' the *Capillairies* in the Superficies of the Body, and be a full Circulation; or else whether the Pulse be *Ad intra*, when it depends on the *Humidum radicale*; and then it moves more slowly in the great internal Vessels, to the dominion or mixture of the *Calor primigenius*, and *Humidum radicale*, they impute all Pulses; the *Pulsus natans*, *Crebro acutus*, *Longus* have a threefold primigenical Heat; and these are hot in the Superficies, and inwardly cold from some mixture of the radical Moisture.

The *Pulsus profundus*, *Raro obtusus brevis*, have a threefold *Humidum radicale*; superficially it appears cold, and internally they say 'tis hot, from a mixture of the *Calor primigenius*.

The plain Sense of all this is, when the Circulation runs outwardly, the Parts within are more cold, and *e contra*; and by the *Calor primigenius* we must understand a great Rarification of the Blood and Spirits; and by the *Humidum radicale*, the Condensation of the same.

The *Chinese* advise to observe the Sex, because Men have a stronger Pulse in the upper place of the Pulse, where the Fore-finger is plac'd; and a weaker in the third place, where the Pulse of Women is strongest, because in them the *Humidum radicale* prevails, and in Men the *Calor primigenius*; and the *Chinese* say the Pulse in the left Hand is greater in Men, and that of the Right in Women.

If the Patient be a Child, the Pulse is quicker; in a Tall Man 'tis longer than in a short; in a Robust Man thicker, in delicate Persons smaller; in a thin Habit thin, in a Fleshy great, in a strong Man Exundant, in Joy empty, in the Sad full, in a brisk Man quick, in a slow remis; and

and they observe that a different Climate, and different Seasons, alter the Pulse.

The two most material Things, by which the *Chinese* judge of the Pulse, are,

1. The two Causes of the Pulse, the Spirits from the primigenial Heat, or the Spirits of the radical Moisture, which are Spirits rarify'd or condens'd according to the *European* Notions ; and they make three Degrees of these, the exceeding, moderate, or the defective.

The Pulses from the Heat are the same as my exceeding Pulses ; the Pulses from the cool Spirits or radical Moisture are my deficient Pulses.

2. The second useful Observation is the Measure of the Pulse by the Respiration, there are naturally four or five Pulses to one Respiration ; and this is their measure of healthful Pulses ; if there be more Pulses in one Respiration the Pulse exceeds, and is too frequent ; and when 'tis too slow or deficient, there are but one, two or three Pulses in one Respiration ; in Children the Pulse is very quick, and they have eight Pulses in one Respiration ; in one quarter of an Hour there are 140 Respirations in Health, and in the same time

not less than 562 Pulses, nor more than 703; in twenty four Hours / they reckon 13500 Respirations, and the Pulses in the same time are not more than 67500, nor less than 54000; they always have acknowledg'd a Circulation of Blood and Spirits fifty times in 24 Hours; tho' the Circulation of Blood has been lately fully discover'd and prov'd, yet the old *Europeans* had a rude Notion of it as appears in *Plato*, the Account of which is thus translated from Mr. *Dacier's*, Pag. 114, in the Life of *Plato*; he says, *The Heart is the Source of the Veins, and the Fountain of Blood, which runs from thence with a rapid Course into all the other Parts;* and I may observe that his Knowledge in Anatomy was as imperfect as that of the old *China Books*.

The *Chinese* direct the Physician to observe after what Number the Pulse intermits; for if 45 Pulses succeed one another without intermission, or any alteration, that Person enjoys perfect Health; and there is in that time nine Respirations.

They direct us to observe whether the Pulse descends from the natural Temper to a deficiency, or ascends to an exceeding Pulse.



2. I will next give some Reflexions on the Errors the Chinese make about the Pulse.

I will first observe, That the *Chinese* Pictures of the Pulse are pure Hieroglyphics, and not yet explain'd to us; and their Pictures of the *Viscera* are no more like them, than the *China* Pictures of Men and Women are like their natural Figures; neither have any Exactness; a little Similitude they think sufficient.

The *Chinese* are very extravagant in comparing their several Pulses to odd Figures and Motions; 'tis true, we want Words for to explain Colours and Tastes, and we therefore describe them by comparing them to known Colours and Tastes, so it must be in the Sense of feeling; we must compare all nice Motions to those that are well known, as that of the Ants motion in the formicant Pulse, or to that motion like a Worm in the vermicular; but the *Chinese* Comparisons are sometimes very extravagant, and the Similitude imperceptible, when they compare the Pulse to a flying Ribband or Feather; the *Pulsus jusculi ubi pinguedo bullit & notat*, a *Pulsus nistar staminis araneæ*, or a Pulse like the motion of a Cock's Wings; and

and here I will make this Remark, that all the very nice touching of the Pulse may be very curious, but not useful, because Physicians must build all their Practice on those sensible *Phænomena*, which are obvious to all unprejudic'd Persons; and those are sufficient, and very evident, as Nature has made all useful Things.

The *Chinese* believe the Pulse beats stronger in the Left, than in the right Arm; but of this I am not satisfied, tho' I have oft found the Pulse to differ in one Arm from that in the other.

In the first place of the right Arm, which is above the Bone of the Joint, they place the Pulse of the Heart, and small Intestines; by which we must understand the Pulse of the choleric Tempers, or the exundant Pulse in Health.

The second Pulse is below the Bone, and shews the Constitution of the Liver and Gall; by this Pulse we must understand the sanguine Temper, and the Pulse is *Chorda tensæ similis* in Health.

The third place of the Pulse is below the second, under the third Finger; and this shews the Constitution of the Veins and Ureters, by which we may understand the phlegmatic Temper; 'tis naturally the *profandus Pulsus*.

In the right Arm they distinguish three places of the Pulse, in the first and uppermost is the Pulse of the Lungs, which shews their natural Temper, and that of the great Intestine; this Pulse is naturally *Natans*, and by this we must understand the salt Lympha.

The second place is under the second Finger, and shews the Temper of the Stomach and Spleen; and this Pulse is naturally remiss, and a sign of the phlegmatic Temper.

The third place shews the Temper of the right Kidney, or *Porta vite*, which as I apprehend relates to the Genitals; and this is *Profundus*, as the Pulse of the Reins is naturally.

All these Observations are contrary to Anatomy, because all the Arteries arise from the same original part of the *Aorta*; and the Blood must be injected into all Parts alike on both sides; and the different parts of the Artery cannot represent the different Constitutions of the Heart, Liver, Kidnies, Lungs, Stomach, Spleen, Genitals; and the Lungs lie on both sides and not on the right, as well as the Stomach, and they allow the Kidnies on both sides; but this is true, if the Blood moves violently, the Pulse is evident above

bove the Joint of the Wrist ; if the Blood moves very slowly, 'tis felt only in the lower place of the Artery, or most there, and less in the upper place above the Joynt.

The Circulation and Pulse must be accounted moderate, if the Pulse appears in the second place most evident under the middle Finger ; therefore by the application of the three Fingers on either Arm, we may discern when the Circulation runs very fast, or too slow, or moderately ; and as to the Pulses on the right Arm, the Pulse of the Lungs differs only in Degree from that of the Heart, whose Pulse is *exundant* ; and that of the Lungs is *Natans*, that is, less *exundant* ; so the Pulse of the Stomach and Liver differ only in degree, the last being *Chordæ tensæ similis*, and the other *Remissus* ; the Pulse of the Kidnies are on both Arms *Profundus* ; the Liver is a Hieroglyphick for the Blood, the Heart for choleric Blood, the Lungs for the salt Lympha, the Stomach for the Pituita, the Kidnies for the Serum ; the Pulses of these several Humours are the same as those mention'd for the several Members ; *Exundans* in choleric Tempers, *Chordæ tensæ similis* in the Sanguine, *Natans* in the Salt, *Remissus* in the Pi-

Pituitous, and *Profundus* in the Serous; and these will signifie the same in both Arms.

The next Error of the *Chinese* is, That they feel the Pulse superficially to the Skin and Flesh, or by a moderate pressure to the Blood and Spirits, or by a greater pressure to the Bones; and then from the superficial they infer, that the cause of the Diseases is without the Body, in the Skin or Flesh; by a moderate pressure they tell whether the Disease be in the Blood or Spirits; but if the Pulse appear most evident near the Bones, they say the Disease is radicated, or from malignant Spirits; by these different pressures they examine the Pulses in each Arm, and so make nine Pulses in each Arm.

I observe, That we know the great Pulses by a superficial pressure; and the small ones must be discern'd by a deep pressure, but the moderate by a moderate pressure; and by the different pressures we may learn whether the Circulation runs to the Superficies, or more internally; but this cannot discover in what part of any diseas'd Member or Region the Disease is fix'd; in Apoplexies the Pulse is great, and yet the external Parts are not affected, but the Brain it self; and in Fe-

vers all Parts are affected both within and without.

The next Error I shall observe is, That the *Chinese* make the three places of the Pulse respect the three Regions; the first Region is from the Head to the Diaphragm, the second from thence to the Navel, the third from thence to the Feet.

All these respects of the Pulse to the three Regions, is contrary to Anatomy; and the Diseases of the several parts have all sorts of Pulses, and may be discern'd in each Arm alike; but this may be admitted, that if we consider the several branches of the Arteries; those which go to the Head and Lungs, and Breast, are nearest to the Heart; and therefore are first sensible of a violent Circulation, and are known by an exundant Pulse; the celiac Branches of the Artery are in a middle distance from the Heart, and send Branches to all the *Viscera* in the middle Region, and are most affected in a moderate Circulation, and this appears by a moderate Pulse; but the Branches of the Artery to the Kidnies, and Genitals and Legs, which are most distant from the Heart, and must be obstructed by a slow Circulation, or require a violent

lent Circulation to affect them with exceeding hot Humours ; in a slow Circulation the serous Humours swell them, and make them cold ; in a hot Intempery they are Hot, and Inflam'd, and full of Pain ; but the upper part, and then the middle, suffer first in all violent Circulations. On the contrary, if the Circulation be too slow, and the Pulse slow, and weak ; first those Parts to which the iliac Arteries, and those of the Kidnies reach, are affected or obstructed ; then those to which the celiac Arteries belongs, and afterwards those of the Lungs, and Head ; so we observe in dying Persons the Circulation fails in the Legs first, in the middle Region next, then in the Head, and last in the Lungs.

No particular Part can alter the Circulation any otherwise than by obstructing the Circulation by Pain, which convulses the Vessels or Humours that obstruct them, or else by too great secretion of them in Defluxions ; the secretion is known by an undose Pulse, and the obstruction by a hard one ; all cold Diseases by a weak slow Pulse, and the hot ones by an exceeding Pulse ; and the useful secreted Humours return into the Blood, and give their Tastes to it, besides all the solid Parts

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communicate with one another in pain by the Animal Spirits in the Nerves and Membranes.

This division of the several parts of the Artery seems useful, and we may know to what branches the Circulation tends, by the greatness, mediocrity or smallness of the Pulse; and if this be approved we must restore the Intestines to the Pulse of the Stomach, as an Appendix of it, because they depend on the *coeliac* Artery.

The next Observation I shall make, is, That the *Chinese* believe the Diseases of each side are evident in the Pulse of the same side; but they erroneously place the Lungs and Stomach on the right side, and the Heart and Liver on the left, as well as their Pulses; but since the Arteries join'd on each side in the same Original Trunk, the Disease will appear alike in both Arms; yet this must be allowed as true, we bleed most successfully in the same side the Pain is, which shews that the Veins and Arteries are more obstructed on one side than on the other, which may alter the Pulse on the same side the Disease happens; and we find the Pulse is alter'd in some diseas'd Parts by Inflammations without affecting the whole.



The *Chinese* have corrupted their Art of feeling the Pulse by mixing their Philosophy of the five Elements with it, as from Water Trees are produc'd, from Trees Fire, from that Earth, from Earth Metals, from Metals Water again; so from the Reins the Liver is generated, from that the Heart, from that the Stomach, from thence the Lungs, from them the Reins. And some property of these Elements they attribute to each Member; to the Heart Fire and Bitterness, which appears most in Summer; to the liver Spirits and Acidity which appears in the Spring; to the Lungs an Acrid or Aduſt Taſte, like that of Metals; and this appears most in Autumn to the Reins and Ureters the nature of Water, which is most common in Winter; to the Stomach and Spleen they aſcribe a ſweet Taſte, and they compared them to moiſt Earth; they ſay the Reins communicates their Qualities to the Liver, the Liver to the Heart, and the Heart to the Stomach, &c. And they farther purſue their Philoſophic Cant, by making the ſeveral Members, Mothers, and Sons, Friends and Enemies to one another, as may be ſeen in *Cleyer*.

The best Sense of all this is the description of the several natural Tempers, or Cacochymias.

I will farther observe, That the *Chinese* have corrupted this Art by mixing Astronomical Observations with those of the Pulse; they believed there is a Circulation of Blood and Spirits in twenty four hours, and that their imaginary Circulation of the *Calidum* and *Humidium Radicale*, corresponds with the Circumvolution of the Heavens; they say the Circulation is performed fifty times in twenty four hours, and in the same time the Heavens move thro' fifty Houses; but we know all this is a mistake, because the Blood circulates once in three or four minutes.

They make twelve ways of the primigenial Heat, and of the *Humidum radicale*, six upwards and six downwards, all which seems very Phantastical; unless they understand by this, that the several six Members and the six Appendices communicate their Cacochymias to several Parts; so the Cholera and the *Æruginose* Humour is communicated to the Spit, Urine, Stools, Vomits, and in the solid Parts it produces an Erisipelas, in the Head, Madness, Deafness, and there must be so many ways of the salt Humour and Choleric.

it be objected, That their mistakes in Anatomy will make the *Chinese* Art fallible.

I may answer, That the want of Anatomy does make their Art very obscure, and gives occasion to use phantastical Notions; but their absurd Notions are adjusted to the real Phænomena, and their Art is grounded upon curious Experience, examined and approved for four thousand Years.

1. By the Pulses of the several Members which are natural, they know the several Constitutions, and by measuring the Pulse by one Respiration they know a healthful State.

2. By the frequent Pulses in one Respiration they know the exceeding Pulses, and by the rare Pulses in the same time they know the deficient, and both shew the *Cacochymias*.

3. By the Pulses *ad extra* they know the Pulses depending on Heat, or Rarification of the Blood and Humours; and by the Pulses *ad intra* they know the condensation or coldness of the Blood and Spirits.

4. By the Pulses in the first place of the Arm if *exundant* they know a large full Circulation, and by the lower

place where the Pulse is *profundus*, they know a weak slow small Circulation.

5. By the respect of the three Places to the three Regions, they know to what Region the Circulation tends most, and by the different pressures of the Fingers they conjecture to what part of the Region the Cacochymia tends; and they affirm, That Heat produces frequency, celerity, greatness, and cold, slowness, rarity and smallness in the Pulse.

6. They acknowledge all our Pulses, and have made more nice distinctions than the *Europeans*.

3. I will next describe the differences of the Pulse observed by the *Chinese*.

The Pulses produced *ad extra* are seven, and they depend on the Primigenial Heat, and then are our exceeding Pulses from Rarification of the Blood and Spirits.

1. Exundants like Water flowing violently out of a Pipe; this is a very great Pulse and vehement, this indicates Pain and Heat, and depends on extreme hot Spirits in an Ebullition or Putrefaction of the Blood, as in Fevers, the *Pulsus natans* and *exundans* indicates Madness, or malignity of Heat.

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The *exundans* and *magnus* indicates a malignant hot Fever.

This Pulse is very much elevated, and appears in the heat of Summer; the *exundans* in the upper place indicates Heat in the Breast, in the middle place of the Pulse, vomiting, in the lower, bloody Urine, or pain of the Feet.

2 The intense Pulse is great and frequent, and 'tis like to a thick Cord, not to a stretched one, and 'tis also *exundant* like a Torrent; it indicates a *Delirium* from a Wind rising to the supreme Parts; this Pulse is the quick great Pulse from Rarification of Humours and Spirits, and it is from a hot Wind, such as is in *Ephemeras*.

A Pulse intense and very quick indicates restlessness.

This Pulse indicates want of Perspiration, a Cough, a Flux, drinking cold Water; this seems the Pulse in Defluxions, and it indicates both hot and cold in the Body, if it be intense and frequent.

The Pulse *natans* and *magnus* indicates a Wind in the Head, with heaviness and stoppage in the Nose.

The Deliria and Melancholic Fevers are indicated by this Pulse, because they depend on hot Winds.

If the intense Pulse be frequent and *chorde tense similis* in three places, it indicates a Wind in the upper Parts, in the first place Head-ach, and in the second Pain.

3. *Pulsus Crebro-acutus*, this is compared to the Motion *gemma rotunda*, and it indicates Pains in the Hands and Feet.

If this Pulse be frequent it indicates a *vacuum* and heat in the Heart.

If *natant* it indicates a Wind, Pain, Fear.

*Pulsus acutus* indicates a Disease in the Mind.

*Pulsus Crebro-acutus celer* indicates Cold in the Belly.

*Remissus Crebro-acutus* indicates Heat within.

This Pulse in general indicates a weak Primigenial Heat.

This is a quick and frequent Pulse, such as is in Hysterics and Hypochondriacs, whose several Symptoms it indicates; the Spirits are weak, and the Blood hot. This Pulse I would appropriate to Atrabiliarian Cacochymias, being quick, weak and frequent, if without a Fever.

4. The *Pulsus natans* seems to me the great undose Pulse; 'tis thus described, *digitum infra natat*, it indicates a hot Wind, Head-ach, red Eyes, Coughs, from a great Rarification of Humours.

A *natant* Pulse, if quick, indicates a malignant Fever.

A *natant* Pulse and remiss indicates hardness of the Skin, and a cold Wind in the Flesh.

*Natans* and *Crebro-acutus* indicates a trouble from a remiss Wind.

*Natans Crebro-acutus celerimus* indicates Indigestion.

*Natans brevis* indicates that the Lungs are injured, and short Breath.

*Natans* and *Frequens* indicates Matter within.

This Pulse, I think, belongs to the Catarrhal Salt Lympha, or Salt Cacoehymia, or saltness of Blood, with a windy Rarification of it.

5. The *pulsus plenus in extremis in medio vacuus*, this indicates Hæmorrhagies, 'tis like the *natant* Pulse, great and soft, 'tis compared to the feeling the leaf of an Onion; it appears full in the sides, but hollow in the middle, a full Pulse in the first place 'tis a sign of redness in the Face, and Wind.

This Pulse in the first place indicates fulness of Blood in the Breast; in the second it indicates a Tumour and Palsie; in the third place emptiness in the Bladder, red Urine, red Flux.

6. The *plenus Pulsus* appears very full without altering upon contraction of the Artery, *Dominatur cadenti calori primigenio*; in the first place of the Pulse it indicates Heat in the Breast, Wind, red Face; in the 2d place Pain of the Heart; in the 3d Fluxes of Urine and Stool stop'd; this full Pulse must be in *Plethoras*; the exundant, and full and great Pulse are signs of Convulsions; the Pulse of the Liver, small and quick, indicates the same.

7. *Pulsus chordæ tensæ similis*, 'tis represented as a great Pulse, long like a Spear.

If this Pulse be *Obliquus*, it indicates a Pain in the side.

This Pulse, if it be *Celerrimus*, indicates Pains in the Stomach.

If it be *Parvus*, it indicates a dispersion of Cold.

If it be *Frequens*, it indicates drinking Water cold.

If it be *Intensus*, it indicates Pains of the sides, and a gathering of Blood by Cold.

If it be slow, use warm Medicines; if frequent, procure Sweat.

This Pulse *Intensus*, seems to be our full hard Pulse, and indicates Pains in the Breast,



Breast, if intense in the first place of the Pulse; but in the second Water, and cold in the Belly; and this is the hard Pulse in Dropsies from Obstruction of the Artery or Compression, or by sily Humours.

All these rise high in different Degrees; first the *Exundans*, next the *Intensus*, then the *Crebro acutus*, the *Natans*, the *Pulsus plenus in extremis*, the *Plenus*, the last *Pulsus chordæ extensæ similis*; all these are higher than the Natural, (*Cum elevatur habet nimium, sicut Pulsus excedens, habet naturam caloris primigenii*) and I call all these exceeding Pulses, and the great ones.

*Note*, That the *Chinese* observe the contraction of the Artery, in describing the access and recess of the Artery; but they make no use of that Observation in Practice.

Sweating is a sign of an exterior Pulse, and *odium venti*.

The Pulses, *ad extra*, are appropriated to the left Hand, because there the Pulse is greatest, tho' they appear in the right as *Hospites* sometimes.

*Si extempore, vento frigore morbus accedat, est ad extra*; that in the Pulses *ad extra* depend on external Heat and Cold of the Seasons of the Year; Heat and Wind rarifies

rarifies the Humours, and Cold stops the Pores; by both the exceeding Pulses are produc'd.

*These are the eight Pulses, ad intra, or the deficient Pulse.*

1. The *Parvus*, which appears to come and recede very little, and indicates the want of Blood and Nutriment in the small Intestines, and driness of the Body, and the *Fluxus albus*.

In the middle place of the Pulse it indicates the Spirits, tend upwards, and are condens'd; coldness of the Body, and Hiccup by drinking cold Water.

The small, weak, and *Raro obtusus*, are signs of ill Digestion.

The *Pulsus parvus natans* indicates some Disease in Autumn.

By the small Pulse we discern the smallness of the Artery, and small quantity of Humours, or the want of their Rarification in the several Parts.

2. The *Pulsus profundus*, if we press it lightly, it appears like putrid *Gossypium*; 'tis little elevated, it appears in fat Persons, and indicates Coldness in the Extremities, or emptiness of Humours, or Water in the Body.

In the first place of the Pulse it indicates Water in the Breast, in the third fulness in the Feet, and various colour'd Urine like Matter, and fulness and disorder in the Mind; if it be weak, it indicates Vacuity and Fear.

If *Chordæ tensæ similis*, it indicates Pain by Drink.

If it be *Tardus*, it indicates a cold Disease in the Stomach; if small and weak, it indicates Cold, and few Spirits.

If it be *Creber*, it indicates Pain in the *Scapula*.

If *Dupliciter profundus*, it intimates hardness and heaviness in the Hands and Feet.

*Note*, By this Pulse we discern the ferrous state of Humours, when they affect the Head, Breast, Stomach, Flesh, Kidnies and Feet; and these are the *Via humidum radicalis*, this is our low Pulse.

3. A remiss Pulse, is when it is small and slow; this is contrary to the intense, which is great and frequent, this indicates cold and condens'd Spirits; the Ears tingle, and the Spirits are watery.

In the second place of the Pulse the Nerves of the Back are affected. In the lowest place the Belly is affected with great Cold.

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4. The *Pulsus tardus* requires a great compression of the Fingers, because 'tis much hid; it signifies watery Diseases, Vacuity, Inquietude.

In the first place of the Pulse it signifies a malignant Fever.

In the second place it signifies a Pain in the Stomach from Drink.

In the third place it indicates heaviness in the Reins, and Feet, and a chilness, tho' oppress'd with Cloths.

The *Pulsus tardus* generally indicates Cold, or small Rarification of Humours.

If it be *Raro obtusus*, it indicates want of Blood; if it be remiss, it indicates a *Vacuum*; if exundant, it indicates Spirits and Heat; if intense, it indicates Cold; if *Chorda extensa similis* and *Frequens*, it indicates a Disease, *Frigido calidum*.

The frequency indicates much Heat, the slowness of the Pulse much Cold.

If this Pulse be small, it indicates Vacuity, if intermitting, it indicates Death.

If *Chorda extensa similis* in the Gout, it indicates a Wind.

Note, That all the Pulses, *ad intra*, are most appropriated to the right Hand, because there the *Chinese* suppose they are slower, but they appear in the left as *Hospites*;

*pites*; if a Disease comes from Sicuity, Humidity or Heat, it makes the Pulse *ad intra*; Heat by large Perspiration weakens the Pulse, Moisture oppresses it; external Sicuity makes the Humours viscid; all these Causes make low Pulses.

5. The *Pulsus raro obtusus*, in elevation 'tis little; it appears empty before, and full behind.

In the lower place of the Pulse it indicates Pain in the Extremity, want of Blood, much Cold; if a Woman conceives it indicates some Pain, without Conception, it indicates Weakness, and destruction of Blood, and Wind below the Navel; this seems to me the Pulse of the cold Melancholics, as the *Crebro-acutus* is of the hot.

6. *Molli subtilis*, it indicates few Spirits, coldness in the Extremity, noise in the Ears; an inward Heat affects the Heart and Intestines.

In the first place of the Pulse it indicates Sweating in the Feet.

In the second place paucity of Spirits, and weakness in the Mind.

In the third place it feels like Cotton, and indicates a malignant Cold in the Flesh and Bones.

In this Pulse the Artery must feel small and soft from few Spirits, and little Blood; this is our soft Pulse.

7. *Debilis*, this Pulse feels like putrid Cotton, 'tis perceptible by a small pressure, and diminish'd by it; it indicates the swelling of the Face, and a malignant Wind; in the first place it indicates the want of Heat, in the second multitude of Spirits, in the third Perspiration destroy'd.

8. *Cadens Pulsus*, this appears below the three places; 'tis obscure, and does not return in the interval of one Respiration; it indicates Poison, Weight, or coldness in the Extremities, Cough, Indigestion.

In the first place it indicates some Collection of Spirits in the Breast, in the second place Indigestion, and failing in the Eyes; in the third place Indigestion, or troubled Sleep, weakness in the Loins.

I will here place a Table of the *Chinese* Pulses according to their Contrariety to one another, and their different Causes.

In the old Book of *Nuy Kim*, the Pulse *Chordæ extensæ similis*, and the *Intensus* are alike; the *Raro obtusus* is the same as *Tardus*, the *Natans* as *Plenus extremis*; the *Profundus* and *Cadens* alike, as well as the

*Exundans* and *Plenus*, the *Molli subtilis* and *debilis*.

The learn'd *European* in *Cleyer* reduces all the Pulses to fix, the *Natans frequens*, *crebro acutus*, which indicate Heat; and the *Profundus tardus*, *raro obtusus*, which indicate Cold.

*These Pulses from Heat.*

1. *Pulsus exundans*, or *plenus*.
2. *Pulsus intensus*, or *Chordæ extensæ similis*.
3. *Crebro acutus*, or *frequens* and *celer*.
4. *Natans*, or *plenus in extremis in medio ruptus*.

*These Pulses from Cold, or radical Moisture.*

1. *Profundus*, or *Cadens*.
2. The *Remissus*, or *Parvus*.
3. *Raro obtusus*, or *Tardus* and *Rarus*.
4. The *Molli subtilis*, or *Debilis*.

In the higher places of the Pulses are the hot Pulses most, and in the lower places the cold Pulses, in the middle places are the most Temperate; this indicates good Health, a moderate Circulation, and an equal distribution of Blood  
and

and Spirits; in the exceeding Pulses the Circulation exceeds outwardly, and it runs to the Extremities most, as to the Head and Feet; but in the deficient Pulses the Head is oppress'd, the Feet cold, and swell, and the Circulation runs inwardly in the great Vessels, and less in the Extremities.

*Note,* That the *Chinese* Descriptions of their Pulses are confus'd, obscure, which demonstrates the Ignorance of the Translators; and the *Chinese* distinguish the Pulses by comparing them to something that feels like them; and they who will know their Meaning, must discern the same by a long Experience in feeling of the Pulses; for they do not consider the Pulse as Geometricians do by its Dimensions.

4. The next Observation shall be concerning the Pulse of the several Constitutions, and the different Seasons of the Year, and the Pulse belonging to each Element.

I. The Pulse of the Reins (or of the ferrous Constitution) is naturally *profundus*, 'tis compar'd to Hair dip'd in Water; if compress'd, it seems to exceed; the contrary Pulse is remis and languid; this  
Pulse



Pulse indicates the Heart to be overcome by watery Veins, that is, by a ferous Cachochymia, in which too much cold Humidity abounds; this Pulse is felt in the lowest place in both Arms; to the Reins are joyn'd the *Ureters, parts vitæ*, or Genitals, and lowest part of the Body, as an Appendix.

2. The Pulse of the Liver (or sanguine Constitution) is *Chordæ extensæ similis longus*; the contrary is *Natans brevis*, the Gall is an adjunct Intestine to the Liver; this Pulse is felt in the second place in the Artery in the left Hand.

3. The natural Pulse of the Heart (or choleric Tempers) is exundant, that is, great and vehement, the contrary is *profundus*; this is felt in the upper part of the left Arm, and shews great Heat, and bitterish Humours.

4. The natural Pulse of the Lungs is *Natans ligni instar fluctuanus*, or *Raro obtusus*, like Rain falling on Sand; this Pulse is *Natans rarus brevis*, the contrary Pulse *Exundans magnus*; by the Pulse of the Lungs the falso acid Lympha is indicated, which abounds in Catarrhs and Rheums, Coughs; this Pulse is plac'd in the upper place of the right Hand.

5. The natural Pulse of the Stomach and Spleen (or the Phlegmatic and Melancholic Cacochymia, is remiss and languid; the contrary *chordæ extensæ similis frequens*; the Pulse of the Stomach is compared to Willow Leaves blown with the Wind; the Stomach is reckon'd as the Intestine of the Spleen, every Member has its Intestine, that is, its secretory Vessels, and this Pulse appears in the second place of the Right Hand.

6. The Pulse of the *porta vitæ* is the same as that of the Rein or serous Constitution; to this is ascribed the Nature of extrinsic Fire and Water.

The differences according to the several Seasons.

The Spirits in the Spring are tepid, in Summer hot, in Autumn moderate, in Winter cold.

In the Spring the Element of Air or of Trees prevails, and the Liver then prevails, and the Pulse is *extensæ chordæ similis*.

In Summer the Heart and Fire prevails, and the Pulse is *exundant*; at the end of every Season the Earth and Stomach prevails, which makes the Pulse flow and remiss.

In Autumn the Element of Metals prevails, and then the Lungs prevail also, which makes the Pulse *natans, brevis, parvus, raro obtusus*.

In Winter the Water and *vesica* have the pre-eminence, and the Pulse is *profundus, subtilis*.

The *Chinese* ascribe to every Element three Pulses.

To the Element of Metals, *natans, raro obtusus debilis*.

To the Element of Trees or Air, *chorde tensæ similis, Intensus, cadens*.

To the Element of Water *crebro-acutus, profundus, molli subtilis*.

To the Element of Fire, *in extremis plenus in medio vacuus, plenus, exundans*.

To the Earth, *parvus, remissus, tardus*.

The inequality of the Elements produce Diseases, and the inequality of Seasons.

5. I will next proceed to the alteration of our Pulses in Diseases.

The *Chinese* attribute the Pulse to these two Causes, *calidum* and *humidium radicale*; the Spirits are the Vehicle of the Heat, and the Blood of the *humidium radicale*, or Cold. From a due mixture of these communicated to the Parts, Life and Health depends, and in the excess or

defect Death, and the Pulse varies with both. In Spring the Heat increases, and is greatest in Summer.

In Autumn the radical moisture increases, and is greatest in Winter, the Blood is the Vehicle of both.

1. The *Chinese* impute their Diseases to a *vacuum*, or *repletion*, or *pulsus vacuus*, or *plenus*, which are the exceeding and deficient Pulses.

2. To a contrary Pulse or Quality which the natural cannot conquer, this they call *vitium latrociniæ*.

3. To a Pulse which the natural can conquer, which is *vitium exiguitatis*.

4. If the natural Pulse be more intense or remiss 'tis *vitium rectitudinis*, that is soon reduced.

Wind is called the *causa vacui*, Diet of repletion, the *vitium exiguitatis* is from weak Spirits or Cold; the *vitium latrociniæ* from Humours and Cold, and is Mortal.

The six places of the Pulse have twelve ways or fountains of the Members and Intestines, and one natural Pulse to each.

The health of the Members is known by the celerity, and that of the Intestines by the slowness of the natural Pulse; the natural Pulse of any Part may have ten  
forts

forts of changes, the five Members and their Intestines being changed twice five times by five vitious Pulses, *viz.* the *vacuus*, *plenus*, *latus*, *exiguus*, *rectus*, the *durities* is from Heat, and makes a great Pulse, *molleties* from Cold, and makes a small; the softness shews the fault of the Intestines, and the hardness of the Members which being joyned to the five vitious Pulses, double their number to ten.

All the ways of the primigenial Heat produce Heat, and the ways of the radical moisture Cold.

By the slowness of the Pulse we find cold Spirits are produced, and vacuity, and cold Winds, by the celerity we know repletion, by velocity Heat, by which hot Winds are produced.

Every Member has its natural Pulse, and præternaturally the Pulses of the other Members happens in its place.

In the first place of the Pulse, if the Pulse be *celerrimus* 'tis a sign of Head-ach.

If it be *tensæ chordæ similis*, it shews a defect of Circularion to the lower parts, and pain in the Head.

If it be intense it indicates pain in the Belly, and the gathering of Spirits.

If it be remiss it indicates a stupor in the Skin, and horror of the Hair.

If small, it indicates cold in the middle of the Breast.

If frequent, it indicates Heat in the Orifice of the Stomach.

A *natant* Pulse in the first place indicates Wind and Head-ach; in the second it indicates vacuity in the Belly; in the third place it indicates Wind in the Lungs, Obstruction of the Belly.

If *crebro-acutus*, 'tis a sign of repletion.

If *raro obtusus*, 'tis a sign of few Spirits, and obstructed Sides and Breast.

If it be only *exundant*, 'tis a sign of no malignity.

If *profunde* the Breast communicates pain to the Shoulders.

If the Pulse be in *extremis plenus in medio vacuus*, it indicates pain at the Heart, and uneasiness from dryness and redness of the Face, if it appears in the second place; but in the first it indicates vomiting of Blood.

In the second place of the Pulse, *Pulsus natans* and *reusissus*, indicates want of Meat.

*Pulsus intensus trahentis instar*, indicates repletion of the Spirits, and quick Breath, of hard Cure.

A Debility with a frequent Pulse indicates Heat in the Belly.

Ten-

*Tension* in the Pulse *crebro-acutus* indicates Cold in the Belly.

*Pulsus parvus* indicates fatness of the Heart, by which it is oppressed.

*Pulsus profundus* indicates an Acidity in the Meat rising up the Breast.

The *pulsus mollis, raro obtusus, debilis, subtilis*, are signs of vacuity.

The *pulsus subtilis* is from *humidum radicale*, it feels like Cotton, and is a very small Pulse; it indicates Cold within, and weakness and pain in the Legs.

If the long Pulse appears in three places like a Spear, 'tis from Heat; it appears in the Spring, and indicates restlessness.

In the third place of the Pulse, the Pulse *crebro-acutus* indicates some disturbance in the Womb.

*Pulsus cadens* is a sign of some Indigestion in Meat.

A small Pulse indicates pain in the Belly without remission.

*Pulsus debilis* indicates Obstructions in the superior Parts, which cause Heat in the Belly.

*Pulsus tardus* indicates coldness in the inferiour Parts.

*Pulsus raro obtusus* indicates Vomiting.

*Pulsus chordæ tensæ similis, & trahentis* indicates a Disease in the Stomach from *humidum radicale*.

*Pulsus intensus* indicates pain in the Stomach.

*Profundus* indicates the seat of the Disease in the Reins.

*Mollis debilis frequens natans plenus in extremis, in medio ruptus*, all these appear in Bloody Urine.

The Pulse in a malignant Fever from Heat, is *natans creber*; from Cold, *debilis mollis subtilis*.

If in the third place there be an *exundant* Pulse, and *chordæ tensæ similis*, it indicates great Heat, and no Sweat; and 'tis without hope; if in the third place the Pulse be *chordæ tensæ similis*, and *profundus*, it indicates a Distemper in the Stomach, and stop of *menstrua*.

If in the right Hand the Pulse is *exundant*, in the third place it indicates a Conception in a Woman; if it be *exundant* in the first place where the *Calor primigenius*, it indicates the Conception of a Male; if in both Hands the Pulses be *exundant*, it indicates the Conception of Male and Female; if the Pulse be *Crebra-acutus*, and *Celer*, it indicates a great commotion



motion of Blood and Spirits, and that the Conception is of ninety Days.

A frequent Pulse in the three places of the Arm is a sign of great Heat.

*The preternatural Pulses of the Via Cordis, or of the choleric Cacoehymia.*

If the Heart has a full and great Pulse, it indicates Wind, and burning Pain in the Head and Face, and its Redness.

If the Pulse of the Heart be small, it indicates Coldness, Vacuity, Fear, and both Cold and Heat.

If the Pulse be full and great, and *Crebro-acutus*, it indicates Garrulity.

If the Pulse be *Crebro-acutus* only, it indicates Heat.

If the Pulse be *Raro obtusus*, it indicates want of Strength, and Speech little.

If the Pulse be *Profundus intensus*, it indicates Pain from Cold in the Heart.

If the Pulse of the Heart be very quick, it indicates Pain in the Intestines, and Obstruction in them.

If the Pulse be *Chordæ tense similis*, it indicates Celerity of the Heart without danger.

If the Pulse be in *Extremis plenus in medio ruptus*, 'tis a sign of vomiting Blood, or Purging of the same: In the second place of the Pulse it indicates Pains of the Heart, Restlessness, redness of the Head and Face.

The Pulses *ad Extra*, or *ad Intra*, if they fall into the first place where the *Calor primigenius* resides, it indicates the different degrees of Circulation; an exundant Pulse is a sign of a great and vehement Circulation in choleric Tempers; but if the Pulse be small, *Raro obtusus, profundus*, 'tis a sign that the natural exundant Pulse and Circulation is deficient; if the Pulse be *Magnus plenus crebro-acutus celerimus*, it indicates a quicker Circulation than the exundant is naturally.

The *Pulsus magnus natans chordæ tensæ similis*, indicates, That the Liver produces a Wind in the Heart, that is, the Rarification of Humours, and the Circulation is less than in the choleric Tempers.

'Tis the *Chinese* Hypothesis, that the three places in both Arms respect the six Members; and 'tis true, that the three places indicate different degrees of Circulation; and as the Pulses *ad Extra*, or *ad Intra* fall into those several degrees, so they indicate differently, all which is succinctly

cinctly represented in *Cleyer's Tables of Pulses, ad Extra, and ad Intra*; by the Hearts Pulse coming into the place of the Liver, and that into the Hearts, or the *Vesica*, Lungs, Stomach, Pulse into the place of the Heart; the mixture of the several *Cacochymias* is describ'd, so the Serum and choleric Blood are mix'd in the first place, when the *Vesica* invades the Heart; the salt Limpha is mix'd with the Blood, when the Pulse of the Lungs comes into the place of the Liver; the Stomach invades the place of the Liver, when the Phlegm and Blood are mix'd, and when one Pulse expels another, one *Cacochymia* changes into the other, so the Serum, by a high Circulation becomes Blood, the Blood choleric, salt; and these by a slow Circulation become Phlegmatic and Serous again; *Ab Arboribus vincitur metallum*, the salt Limpha is temper'd by Blood, when pure; *Ignem vincit aqua* much serum oppresses the Choler, and dilutes it; *Metallum superat ignis*, Heat encreases the salt Humour; *Terra superat Arbores*, the Chyle oppresses the Blood; *Aqua superat terram*, the Serum damnifies Digestion.

Preternatural Pulses of the Liver, or *via hepatis*, or sanguine Constitution.

If

If the Pulse relating to the Liver be *Chordæ tense similis* in three places of the Pulse, the Blood abounds too much, Tertians and Anger infest us.

The *Pulsus mollis*, and *Chordæ tensæ similis* is natural, and the Heat is Temperate like that in the Spring.

An intense Pulse indicates a small Affection in the Nerves.

If *subtilis natans magnus plenus*, it indicates red Eyes.

If the Pulse of the Liver reaches above, the middle place it indicates obscurity in the Eyes, heaviness in the Head, pain in the Nerves.

The Pulse in *Extremis plenus in medio vacuus*, indicates obscurity in the Eyes, and vomiting Blood, swelling in the Hands and Feet, impotency of Walking.

The *Raro obtusus* indicates vacuity of Blood, and obstruction in the Sides.

If *Crebro-acutus*, it indicates Heat in the Blood, or Head and Eyes.

If it be *Intensus plenus*, or *profundus*, it indicates a Tertian, Indigestion of Meat.

If *Tensæ chordæ similis*, and *Intensus plenus*, or *Profundus*, it indicates Tertians, Indigestion of Meat, Obstructions.

If

If small, weak, natant, it indicates weak Spirits, obscurity in the Eyes.

If very natant, it indicates weakness of Nerves, want of Strength, and Palsy in the Extremity.

Many and quick Pulses indicate Heat, few and slow indicate Cold.

To the first place of the Pulse the *Calor primigenius* belongs, to the lower place of the Pulse the *Humidum radicale*.

If the Pulse, *Chorda tensæ similis*, be in the place of the primigenial Heat, the Head-achs.

If the *Pulsus chordæ tensæ similis* be in the place of radical Moisture, there is Pain in the Stomach.

If the Pulse be frequent in the place of the primigenial Heat, the Head-achs, and Vomiting accompanies it.

If in the place of the *Humidum radicale* the Pulse be small, it indicates a Flux, and noise in the Belly from Wind.

A full Pulse in the place of the primigenial Heat is a sign of Redness in the Face, and Wind.

A small Pulse in the place of the *Humidum radicale* by Sweat stop'd, indicates a Restlessness.

A small, weak, natant Pulse in the place of *Calor primigenius* is a sign of Cold.

A frequent Pulse in the place of the *Humidum radicale*, indicates Heat in the Stomach, and foetid Mouth in the same place, *Pulsus acutus creber* indicates Indigestion.

A Pulse great, full, *Crebro-acutus*, indicates Garrulity, if in the place of the *Calor primigenius*.

If the Pulse of the Heart and Liver be *Profundus*, 'tis a sign of Flux of Blood downwards, and of Heat and Death the 7th Day.

*Note*, That there are two sorts of preternatural Pulses; those, *ad Extra*, from primigenial Heat; those, *ad Intra*, from radical Moisture; and in describing the *via Cordis, hepatis, vesicae*, as these Pulses happen in the three different places, they indicate the several Parts affected by that *Cacochymia*, either cold or hot, as the Pulse indicates.

Since the *Chinese* do not use the Pulse in discovering the Diseases of Children, they observe the Red, Blue, Pale, Yellow, Black Colours in their Faces, and their different Habits.

Lean, Fat, Delicate, the Temper of the Mother, or Born in the Ninth, Tenth Month, which last is ordinary, and most perfect; they also observe the Heat and  
Cold

Cold of the Fore-head, and from Heat a Wind is produc'd, and Cough from cold Vomiting, Purging; they feel the Pulse by one Finger, in a Child above Five; and if he has six Pulses in one Respiration, they believe him in Health.

Tho' the *Chinese* allow of the Circulation, yet their Application of it is very Phantastical; for they imagine that it begins from the Center towards the way of the Lungs; and from thence to the way of the great Intestines, so to the way of the Stomach, then to the way of the Spleen, Heart, small Intestines, Ureters, Reins, *Pericardium*, third part of the Body, Gall, Liver, where it ends; they derive the *Humidum radicale* more or less intense from the six principal Members; but from the six ways of the less principal Members, they derive the primigenial Heat, being more or less intense, and the ways of the *Humidum radicale* are more inward, and in the fore part of the Body; the ways of the Heat are outward, and in the hinder part of the Body.

There is a Path assign'd to the twelve Ways, whereby one Member communicates with the other, to which it has some Relation.

To

To the Circulation the *Chinese* assign eight extraordinary ways.

All these ways must be some Description of the Arteries, and Nerves and Veins.

The Enmity and Production of the several Members must be explain'd by the respect the *Cacochymias* have to one another; as *Renum mater est pulmo*.

The salt *Lympha* of the Lungs passes by Urine, and produces it.

*Filius hepar*, that is, out of the Serum of the Blood, the Blood it self is produc'd.

*Hostis est lieu & Stomachus*, that is, the sweet and acid Humour, are contrary to saltness of the Serum; *Hospes est cor*, that is, the choleric *Cacochymias* is mix'd with the Urine; so we must interpret the Contrariety and Production of the Liver, Heart, Stomach, Lungs, as I have done that of the Reins from the Serum of the Blood the Blood is produc'd, (*Hepatis mater sunt Renes*) from the pure Blood the choleric Blood is produc'd, (*Filius cor*,) the salt *Lympha* of the Lungs infects or alters the pure Blood, (*Hostis pulmo*, &c.) the sweet Chyle is mix'd with the Blood, and increases it, and helps its Motion, (*Hospes lieu & Stomachus, cordis Mater est hepar*;) choleric Blood is produc'd from the pure  
Blood,



Blood, *Filius lien & Stomachus*; the Spleen, Acid is produc'd by aduſtion of the Blood, and the Stomach has its Ferment from the Blood, *Hostis ſunt renes*; the crudity of the Serum is contrary to the choleric Blood, and corrects it.

*Hospis pulmo*, that is, the ſalt Limpha mixes naturally with the Blood.

*Lienis & Stomachi Mater eſt cor*, the choleric Blood produces the ſplenetic Humour, and the Ferment of the Stomach, *Filius pulmo*; the ſalt Limpha ariſes from the Chyle by aduſtion, *Hostis hepar*; pure Blood has little of the phlegmatic and ſplenetic Humour, *Hospites ſunt renes*; the ſalt Serum is naturally mix'd with the crude Chyle, and acid Humour.

*Pulmonis Mater ſunt lien & Stomachus*, the ſalt Limpha of the Lungs is bred from the Chyle, and acid Humour, both are mix'd in the Stomach, *Filii ſunt renes*; the ſalt Urine is from the ſalt Limpha, *Hostis eſt cor*; that is, the choleric Caco-chymia encreaſes the Acrimony of the Limpha, *Hospes hepar*; the pure Blood mixes with it, and tempers the Acrimony.

Since the choleric Caco-chymia appears both in the Heart or Blood, and ſmall Inteſtines; therefore they are joyn'd as a principal Member and Inteſtine.

The *Folliculus fellis* is joyn'd to the Liver, because the Sanguification depends on the Gall.

The Stomach is joyn'd with the Spleen, because the splenetic Acid appears in it.

The thick Intestines are joyn'd with the Lungs, because a windy Chyle affects both with Inflations; the Reins are joyn'd with the urinary Canals, because the Urines pass all of them alike; and to the right Reins, the *porta vitæ*, or spermatic Vessels, because they are neighbouring Parts.

The same Pulse shews the Diseases both of the five Members, and their Intestines; but the Members have a Pulse more hard, great and quick; and the Intestine's Diseases are known by the softness and slowness joyn'd with the same Pulse.

*The Pulse of the Bladder, or viæ vesicæ, or serous Constitution, and its preternatural Alterations.*

The natural Pulse of the Bladder is in the third place of both Arms call'd *Che*, and it is *Profundus*.

If the Pulse be slow in all the three places, it indicates Coldness, and that the Skin and Flesh are dry'd.

If

If *Raro obtuse*, the Hair is dry'd.

If the Pulse be *Plenus crebro-acutus*, it indicates a Strangury ; if *Plenus magnus*, a stoppage in the Ureters, and Heat there.

If *Crebro-acutus chordæ tensæ similis*, it indicates weight in the Reins and Feet.

If *Profundus intensus*, it indicates Pain.

If the Pulse be *Profunde*, only *Mollis creber equalis*, it indicates that there is no Disease.

If *natant intense*, it indicates Deafness.

If the Pulse be *Natans irrepens*, the danger is in the Stomach.

The *Pulsus profundus* of the Bladder, and *Natans*, indicates a watery Wind ; if *Vacuus*, Death ; if *Chordæ tensæ similis*, Death ; the quick Pulse of the *Vesica* and *Profundus*, and the great Pulse of the Liver quick and *Profundus*, are signs of the Small-Pox.

The Pulse in the third place of the right Hand, is *Profundus crebro acutus*.

*The Pulse of the Lungs, or of the salt Constitution, or of the way of the Lungs.*

The natural Pulse of the Lungs is *natans, rarus, brevis*, the contrary is *magnus, exundans, chordæ tensæ similis*.

If the Pulse be also *natans*, it indicates Wind in the Lungs, and *mucus* in the Nose; and Heat and Cold, Pains in the Skin and Flesh, sharp Tears with Pain; all these are Signs of Defluxions.

If *natans* and *plenus*, the Throat is sore, stoppage in the Nose, binding of the Body.

If *plenus magnus crebro-acutus*, it indicates dry Hair, driness in the Nose, dry Throat.

In Autumn 'tis *pleno solidus*.

If the Pulse be profund intense *crebro-acutus*, 'tis a sign of a Cough.

If the Pulse be natant and small, it is in the *via pulmonum*; if exundant, it indicates fulness in the Breast, and Flux of the Belly, or Wind.

If *chordæ tensæ similis*, it indicates Cold in the inner parts of the Intestines.

If the Pulse be in *extremis plenus in medio vacuus*, it indicates cruel Pain.

If the Pulse be *profundus subtilis*, and *crebro-acutus*, the Bones are burnt, the Skin obstructed, and Heat and Cold affects it.

The profund Pulse of the Lungs indicates Hæmorrhagies, and Heat and Death.

*The preternatural Pulses of the Stomach,  
or of the via Stomachæ.*

Its natural Pulse is remiss and languid ; if it lose its Strength, 'tis intermitting like the pecking of Birds.

If the Pulse be remiss in all the three places, it indicates Heat of the *Stomach* and *Fætor* in the Mouth, and Vomiting, Weakness, swelling of the Gums.

If the Pulse be *plenus* and *natans*, it indicates Heat, good Digestion ; but the Stomach has Emptiness and Thirst.

If the Pulse be *crebro-acutus*, it indicates Heat.

If the Pulse be *raro obtusus*, it indicates small Appetite, and weak Digestion, and little Nourishment of Parts.

If small and natant, it indicates some accidental Heat, which goes and comes, and the Pulse is small and remiss.

If the Pulse be *intensus*, it indicates Pain in the Stomach, and Disorders in the Nerves, Nauseousness.

If *chordæ tensæ similis*, it indicates much Blood, as the Spirits of the Liver do fill it, which is a sign of Health.

If *magnus* and *plenus*, it indicates Pain of the Heart.

If the Pulse exceed the second place, it indicates that the Spittle flows out.

If the five Members have not their proper Sounds, Colours, Odors, Savors, and Liquors, they will not have an agreeable Pulse.

If the Sick delight in Acrids, the Lungs are affected; if in Bitters, the Heart; if in Acids, the Liver; if in Sweets, the Spleen or Stomach; if in Salt, the Kidnies.

The Liquor of the Heart is Sweat, of the Liver tears, of the Lungs a *mucus*, of the Stomach a *saliva*, of the Kidnies Urine.

The *Chinese* make five Fluxes; the white from the great Intestines; the red from the small; the yellow from Indigestion; another from windy Spirits; the fifth from want of Retention.

*The Nine ways of the Pulse compar'd to the nine Stars, nine Regions, nine Members.*

1. The long Pulse, it is found longer than the three places like a Spear; it is from Heat in the Spring it appears most, and indicates Restlessness, Heat in the Members, and inclination to Sleep.

2. A short Pulse, it is from the radical Moisture, and shews want of Digestion; this does not reach the place of the three  
Pulses

Pulses in the Arm ; the Heat is depressed by the radical moisture ; Cold is in the Intestines, and the Meat produces cold Spirits.

3. The *Pulsus vacuus* depends on radical moisture, 'tis a deficient Pulse ; it indicates small Spirits, much Fear, little Blood in the Members, which produces a troublesome Heat.

4. The *Pulsus celer* is from Primigenial Heat ; 'tis very frequent in the first place.

5. *Pulsus ligatus* depends on the *humidum radicale*, it comes sometimes, (or intermits) and returns ; it indicates a Pulse in the four Parts of the Body, and sadness, and windy Spirits in the Bowels.

6. *Pulsus vicarius* is from the radical moisture, it sometimes moves like the *natans*, and rises, but cannot return ; it is in the Lean and Weak, and Speechless ; this is the Vermicular Pulse.

7. *Pulsus trahens* from radical moisture, we cannot find it after the Finger has felt it, but after examination it is ; it indicates pains in the Hands.

8. *Pulsus tum seu motus*, it indicates a Hæmorrhage, and Lassitude from Emptiness ; it rises from the Spirits, which are in the *humidum radicale* ; 'tis the *pulsus profundissimus*.

9. *Pulsus subtilis* is from the *humidum radicale*, its feels like Cotton, 'tis very small; it indicates Cold within and Weakness, pain in the Legs.

All these Pulses which depend on Heat ought to be referr'd to the Pulses, *ad extra*; all those which depend on radical moisture to the Pulses, *ad intra*.

### *Prognostication from the Pulse.*

In the time of one Respiration there are four Pulses, or five without any Disease; if there be three the Pulse is too slow; if two, there is extream Coldness; if six, *ictus*, the Pulse is too frequent; if seven, the Pulse is very quick, and very much Heat; if nine, it indicates Death; if ten, more dangerous; if eleven or twelve immediate Death; one or two, *ictus*, in one Respiration, indicate Death; one *ictus* in two Respirations is certain Death; slow Pulses indicate Cold, frequent Heat; Heat produces hot Winds, Cold Aereal Spirits.

The *Pulsus ad extra* shews the Diseases in the extremity; the *pulsus ad intra*, the Diseases within the Body.

The *Chinese* suppose Circulation of the Blood in the Veins, and of the Spirits within,



within, and without, the Blood, in twenty four hours fifty times; and they believe the number mentioned sometimes exceeds, or is deficient; and both extremes are dangerous or mortal.

If a small Pulse in a fat Man be *subtilis*, 'tis as a thred of Silk, and intermitting 'tis a sign of Death.

A fat Man if the Pulse be burning, is in danger.

If a brisk Man have a rare Pulse, and if a dull, unactive Man has a quick Pulse, 'tis dangerous.

If the Pulse in the third place be very slow, or does not answer to the first place, after half a day they dye.

If in the third place there be the Pulses of the Liver and Stomach, 'tis a sign of Indigestion; and if much of the Pulse of the Liver, they dye; if there be much of the Pulse of the Liver and Lungs, 'tis a sign of a Dropsie, and swelling of the Hands and Feet; and if much of the Pulse of the Lungs, Death.

If the Pulse of the Heart and Liver be there together it signifies difficulty of Speech, stupidity of Senses, and weak Circulation.

The distruption of the Reins are indicated by *pulsus instar lapidis projecti*, by  
blackness

blackness in the Face and continua.  
Sweat.

The destruction of the Liver by *pulsus instar chordæ recens extensæ*, and by a blue Countenance, continual Sweat.

The destruction of the Heart is indicated by a black Tongue, and *pulsus instar fasciæ volantis*.

The destruction of the Lungs by the dryness of the Skin, defluxion of Hair, and by *pulsus instar plumæ in aere fluctantis*.

The description of the destruction of the Members, must be the destruction of the Circulation, in the several Cacoehymias when they prove fatal.

The Pulse coming *sicut turmatim equi aut aves*, is fatal.

If the Pulse does not agree with the Disease, 'tis fatal; in pains of the Stomach the Pulse ought to be *subtilis parvus*; if it be *magnus natans longus*, 'tis fatal.

The *pulsus parvus, subtilis interruptus* is fatal; and so is the *profundus celer debilis semper natans*.

If a Man be in appearance ill, but the Pulse be good, there is no danger; and if he be not sick, but have an ill Pulse, 'tis dangerous.

These

These intermitting Pulses are signs of Death.

*Pulsus lapidis à brachio projecti celeriter.*

*Pulsus instar solute fasciae, pulsus similis ictui, quem aves dum carpunt grana faciunt, pulsus similis stillicidi domus, elevati pulsus similes saltibus ranarum.*

*Pulsus similis saltanti pisci,* a Pulse like a Globe is fatal.

Tho' the Pulse be wanting in the first or second Place of the Arm; yet if in the third it be equal and proportionable to the Respiration, there is no danger.

*A Table for the Chinese Prognostication by the Intermission of Pulses.*

| <i>The Intermission.</i> | <i>The Prognostication.</i>  |
|--------------------------|------------------------------|
| After 1 Pulse            | Death the next day.          |
| After 2 Pulses           | Death the third day.         |
| After 3 Pulses           | Death the fourth day.        |
| After 4 Pulses           | Death the sixth day.         |
| After 5 Pulses           | Death the fifth or seventh.  |
| After 6 Pulses           | Death the eighth.            |
| After 7 Pulses           | Death the ninth.             |
| After 8 Pulses           | Death the tenth.             |
| After 9 Pulses           | Death the tenth or eleventh. |

After

|                 |  |
|-----------------|--|
| After 10 Pulses | Death in the beginning of Spring, or Summer.             |
| After 11 Pulses | Death in the beginning of Autumn or Winter.              |
| After 12 or 13  | Death after one year in the beginning of Autumn.         |
| After 14 or 15  | Death in the beginning of Summer or Winter after a year. |
| After 20        | Death after a year in the beginning of Autumn.           |
| After 21 Pulses | Death in two years.                                      |
| After 25        | Death in one or two years in the beginning of Winter.    |
| After 30        | Death after two or three years.                          |
| After 35        | Death after three years.                                 |
| After 40        | Death after four years.                                  |
| After 50        | Death after five years.                                  |

50 Pulses without interruption is a sign that all the principal Members, and the less

less principal, had their natural Spirits, by which they move the Circulation, and the Body is in perfect Health. If after 40 Pulses there be an Intermiſſion, the Reins are injur'd; if after 30 the Spirits of the Reins and Liver are affected, and want Spirits; if after 20 the Reins, Liver, and Spleen are affected; if after 10 Pulses the Reins, Liver, Spleen, Stomach, Heart and Lungs want Spirits.

*Note,* By the Intermiſſion in the several Members must be understood, the Intermiſſion in Blood and Spirits, tinctur'd with the several Cacochymias; so the Intermiſſion in a Serous Constitution, Choleric, Phlegmatic, &c.

*Note,* That the *Chinese* suppose the Air is attracted into the several Members, and there produces their Spirits, which immediately manage the Circulation.

*Prognostications concerning the destruction of the Members, that is, of the Cacochymical Bloods.*

|                                    |                          |
|------------------------------------|--------------------------|
| <i>Destruction of the Members.</i> | <i>Prognostications.</i> |
|------------------------------------|--------------------------|

|                                     |                          |    |
|-------------------------------------|--------------------------|----|
| If the Liver or Blood be destroyed, | They dye on the 8th day. | If |
|-------------------------------------|--------------------------|----|

If the Gall be destroyed and the Eye-lids fall.

They dye on the 7th.

If the Nerves be destroyed,

Death on the 8th or or 9th, a sign of which is a blue colour in the Nails.

If the Heart be destroyed,

Death after 1 or 2 days.

If the small Intestine be destroyed,

Death on the 6th.

If the Stomach be destroyed,

Death after 12 days

If the Belly be destroyed as in a *Lumbago*, with pain in the Back and debility of Motion,

Death after 5 or 8 days.

If the Flesh be destroyed, Death after 6 days, as in Bloody Stools,

Death after 6 days, or 9, if there be a Tumour in the Feet.

If the Lungs be destroyed, as in *Dyspnæas*,

Death after 3 days.

If

- If the great Intestines are destroyed, This is Incurable, 'tis known by a continual Flux, and Death comes when it stops.
- If the *Vesica* be destroyed, Death on the 4th day, or 7th.
- If the Bones are destroyed, the Teeth are yellow, the Pulse undose, Death after 10 days.

The signs of the destruction of the Parts, and their Pulses may be seen in the Tables; and the destruction of a Part is the loss of Motion, or of Secretion, which is fatal; or too much Secretion by depravation of Humours Secreted; or the destruction of its solid Parts, by Inflammations, Tumours, Defluxions, Pains, Hæmorrhagies, &c.

*Ths Pulses of the several Seasons being preternatural.*

*The Prognostications.*

If instead of the Pulse in the Spring there

Death happens in the *ciclo sexaginario*, being to number it hap-

happen the Pulse  
of Autumn, *raro*  
*obtusus*,

If the Summer has  
the Pulse of the  
Winter, *profun-*  
*dus*,

If in the Winter  
the Pulse of the  
Stomach hap-  
pen *tardus*, and  
*languidus*, instead  
of the *profundus*,

If in Autumn in-  
stead of the *raro*  
*obtusus*, the *ex-*  
*undant* Pulse of  
the Summer,

from the begin-  
ning of the Spring  
betwixt the 57th  
and 58th day.

Death happens in the  
*ciclus sexsagenarius*,  
beginning to num-  
ber it from the be-  
ginning of Sum-  
mer betwixt the  
39th and 30th day.

Death happens in the  
*ciclo sexagenario*,  
which is number'd  
from the begin-  
ning of the Win-  
ter betwixt the  
44th and 46th  
days.

Death happens in the  
*ciclus sexaginaris*,  
which is number'd  
from the begin-  
ning of Autumn,  
in the 33th or 34th  
days.



In the 5th Season  
of the year,  
which continues  
18 days at the  
end of the 4 an-  
nual Seasons ;  
instead of the  
remiss Pulse  
these be the  
*chordæ tensæ si-*  
*milis.*

Death happens in the  
*ciclus sexaginaris*  
betwixt the 53d  
and 54th days.

In external Pain there is a repletion  
without, and vacuity within ; in internal  
Pain there is a repletion within, and va-  
cuity of Blood, Heat, Secretions with-  
out.

All colours are imputed to the Liver,  
that is, the Blood ; in the Heart or Cho-  
leric Tempers, it makes a florid colour  
in the Face ; in the Phlegmatic, or Diseases  
of the Stomac, the Heart or Blood makes  
a yellowish colour ; in the Diseases of the  
Lungs, the Liver (or Blood) makes a pale  
colour ; in the Diseases of the *Vesica* (or *Se-*  
*rum*) the Liver makes a black colour,  
from stagnating Blood ; the Liver in it  
self has a blue colour.

The Heart or Choleric, rarified Blood,  
produces all Odors ; in it self it has an

adult Fætor, *via cordis ingrediens stomachum producit odorem suavem*, that is, the hot Blood digests the Chyle by its ferment; *Ingrediens hepar ibi facit odorem carnis*, that is, the Choleric Constitution, if the Blood abounds, are very Fleshly; *Ingrediens pulmones facit odorem carnis putridæ*, that is, Choleric Blood corrupts the Lungs.

The Pulse is *exundans magnus Intensus*, when any one hates Fætors, and 'tis a true sign of great Heat. In all Indigestions the *Chinese* observe, that there is a natural Appetite for Bitters.

The Stomach, that is, the Chyle, produces all Tastes, *si via ejus ingreditur hepar facit ibi acidum saporem*; the Acid of the Blood is from Chyle, *si ingreditur, Cor facit ibi saporem amarem*, by long digestion the Chyle is made bitter Choleric; it makes a burning Taste in the Lungs, and a Salt in Urine, and it has a sweet Taste in it self.

The Lungs produce the 5 sounds in the 5 Constitutions; in the Sanguine, sighing; in the Choleric, loquacity; in the Phlegmatic, singing; in the Salt Lympha, weeping; in the Serous, a *Singultus*.

We must joyn the common signs of Diseases with the Pulse to confirm our Judgments, and adhere to the Indication

or

or Prognostication by the Pulse, before other signs.

A quick *exundant* Intense Pulse indicates Heat, and gentle Wind.

A weak Pulse, *languid, profund, subtile*, slow, indicates a cold Disease, and cold Wind; the frequent Pulses are signs of Heat, the rare of Cold.

If in the way of the Pulse of the Heart there be 45 *ictus* without changes, all is well; but if after 31 *ictus* the Pulse be *profund*, and intermitting, it becomes natural in the Spring; but it indicates mischief next Summer; and if it appears so in the Summer, it indicates Death in Autumn.

If in Winter, when the Pulse is *profundus*, after 31 *ictus* the Pulse be *natant*, he dies in the 3d month.

If we feel the Pulse in the *via hepatis*, if after 36 *ictus* in the Summer the Pulse be *profundus*, it indicates Wind and Heat.

If after 39 *ictus* the Pulse be rare and weak, it indicates destruction of the Member, and Death.

If after 19 *ictus* the Pulse be *profundus*, it indicates certain Death.

If in the *via Vesicæ* there be 45 *ictus* without stop, it is a sign of Health there; but if the Pulse be very quick it indicates

Heat; if *pulsus chordæ similis*, Wind; *languid* and *tardus* indicates destruction of the *Vesica*.

If after 25 *ictus* the Pulse be *profund* it indicates destruction of the Urinary Members.

If in the way of the Lungs, if the Pulse be naturally 45 *ictus*, all is well; if very quick it indicates Wind; if after 27 *ictus* the Pulse be *languido tardus*, it indicates cold in the Lungs; if the Pulse be *profunde*, it indicates a *Somno lentia*; if it stops after 12 *ictus* it indicates a Cough, and spitting Matter, and falling of the Hair, of difficult cure.

If in the way of the Stomach there be 45 natural Pulses, all is well; if the Pulses be quick, the Stomach is hot, and cannot digest; if the Pulse be *languid* and slow, the Stomach is cold.

In the *Porta vite* 45 *ictus* naturally are signs of Health; if after 19 it be *profund* it is very fatal.

If 45 *ictus* happen without a stop, the Body is in Health; if after 45 *ictus* the Pulse stops, it indicates the destruction of one Member, and Death in 4 years; if after 31 *ictus*, then Death in 3 years; if after 21 *ictus* there be a stop, then Death in 2 years; if after 15 *ictus* there be an intermission,

mission, it indicates Death in 1 year, if in a less number, sooner; if it stop after 3 *ictus* it indicates Death in 6 or 9 days; if after 4 *ictus* Death after 8 days.

In a Malignant Fever and hot Diseases, the Pulse is *exundant* and quick, they pass the place of great Heat; and if they appear so in one day, they recover; but if below the place of the Reins, the Pulse be small and *languid*, and be sometimes *cadent*, and is observed slow and *languid*, 'tis dangerous.

There are not many Diseases from Siccity; all the great increase in the day, but the slow, weak, and *exundant* small decrease more.

A hot Disease ought to have a *natant exundant* Pulse, but if it be subtil and small, it cannot be cured.

After sweating the Pulse is more quiet. A very hot Breath and troubled Pulse, is dangerous.

The *pulsus crebro-acutus* is a sign of Life, the *raro obtusus* of Death.

The Malignity of the *calor primogenius* produces a perturbation, and restlessness in the Limbs, and redness of the Face, and spots in the Skin, and Delirium, motion in the Throat; sweating in the extremity; the opening of the Mouth, like a

Fish, are dangerous ; if it holds out seven days they may escape.

A Malignant Fever from the malignity of the *humidum radicale* produces heaviness, oppression of the Shoulders, pain in the Eyes, which is intolerable ; vehement pain in the Stomach ; black or blue colour in the Mouth ; oppression in the Heart from venomous Spirits ; coldness in the extremity, the Pulse is *subtilis* and *profundus* ; if in six days the Disease can be cur'd, it will succeed well.

If in Diseases of the Belly the Pulse be great, there is no danger ; if small and empty there is great danger ; the strength is like a *balista intensa*.

In Bleeding, the Pulse ought to be *parvus & exiguus*, and it is well ; but a great *exundant* is fatal ; the Disease of restlessness has the Pulse of Madness.

If they be then full, *trahentis instar magnus creber*, 'tis a hopeful case ; but if the first, second and third place have a *profund* Pulse ; and sometimes *subtilis*, 'tis dangerous in Phrensies.

The Pulse of great Thirst is quick and great, and is a sign of Life, the empty and small is sign of a deep Disease, which cannot easily be cur'd.

In a Disease from Water, if the Pulse be natant and great, 'tis a sign of Life; if *profunde* and *subtile*, 'tis a sign 'tis agreeable to the Diseases; small and slow Pulses are signs of Restlessness, because there are few Spirits, and of little Speech; if the Pulse be great, 'tis hardly cur'd.

In three places, if the Pulse be *natans* and *exundans*, it may be easily cur'd; in bleeding at the Nose, and vomiting Blood, the Pulse ought to be *subtilis* and *profundus*; but if it become *natans* and *magnus*, 'tis dangerous.

The various Pulse is not cur'd.

In Diseases from Pain of the Heart and Belly, the Pulse ought to be *profundus subtilis*; but if natant and great, *chordæ tensæ similis vel longus*, 'tis fatal.

If the Pulse be *magnus* and *frequens* in three places, or a long Disease, 'tis a sign of Life; and the *parvus* and *cadens* in a long Disease, are signs of Death.

In the three places, the *pulsus mollis debilis*, in a long Disease is not to be cur'd, but is cur'd of it self; but if disturb'd by Physick, 'tis fatal.

In the three places, the *pulsus natans*, and *alligatus seu ruptus*, in a long Disease is fatal; *natans*, and *crebro-acutus*, in a long Disease indicates Death; *natans*

and *frequens* in a long Disease signifies Life.

In the three places, the *Pulsus raptus* in a long Disease signifies Life.

*Chordæ extensæ similis*, and *frequens*, in a long Disease, is a sign of Life; if pure and frequent, like Quicksilver, it indicates venomous Worms, and Death; if *frequens* and *mollis*, the same Worms, but Life.

In three places, *Pulsus jusculi ubi pinguedo natat & bullit*, in a long Disease is fatal.

In three places the Pulse is like *stuminus aroneæ*, in a long Disease intimates Death.

In three places the Pulse is like a bent Bow, which indicates Death; or if it be like to *funiculo*, or *coronæ unionum*, 'tis fatal.

In three places the Pulse is like running Water, after a Quiet in a long Disease is cur'd of it self.

If the Pulse be like *stillicidium domus*, they die in ten or fourteen Days.

If the Pulse be in three places like the pecking of Birds in a long Disease, they die in seven Days.

If the Pulse be *similis aquæ ferventi in lebere* in the Morning, they die at Night;

if



if the same be in the middle of the Night, they die at next Noon; if in the middle of the Day, they die at Midnight.

In a malignant Fever from Heat, there is a *Delirium*, Fluxes, Sadness: In a malignant Fever from the *humidum radicale*, they have great Lassitude or Weight in the Limbs, coldness in the Extremities, sickness at Stomach.

In a malignant Fever from extraordinary Heat, this is the third Species; if the Pulse be exundant and great, 'tis a sign of Life, the *profundus subtilis* of Death.

If in Pain of the Head, if the Pulse be *natans*, and *crebro-acutus*, it signifies Life; the *brevis*, and *raro-obtusus*, Death.

In Diseases of the Stomach, *ilia*, and *viscera natans magnus*, 'tis a sign of Life; if *vacuus* and *parvus*, 'tis a sign of Death.

In Fluxes of the Belly, if the Pulse be *exilis parvus*, 'tis a sign of Life; if *natans exundans*, 'tis a sign of Death.

In a *Delirium*, if the Pulse be *plenus* and *magnus*, Life; if *profundus* and *debilis*, it foretels Death.

In great Thirst, if the Pulse be frequent and great, Life; if empty and small, it indicates Death.

If the Colour of the Sick be agreeable to the Pulse, they recover; if contrary, they die; the five Members make five Colours in the Face.

The *calor ceruleus* is from the Liver, and must have the Pulse of that Member.

The red Colour must have the Pulse of the Heart, *magnus natans*.

The Colour of the Face, yellow, must have the Pulse of the Stomach, *remissus magnus*.

The pale Colour in the Face must have the Pulse of the Lungs, *natans, brevis, rarus*.

The black Colour in the Face has the Pulse of the Kidnies, *profundus debilis mollis crebor*.

By these Colours, Sounds, Odors, Tastes, Liquors, we may discern the Diseases, as well as by the Pulse: The Colours appears most in the Eyes, red, from the Heart; white, from the Lungs; black, from the *Vesica*; yellow, from the Stomach; Sky-colour'd, from the Liver; and since by the Colours of the Face, we know the *Cacochymias*, and the Colours belong to each Member; 'tis plain, that the *Chinese* describe the Pulse of the *Cacochymias* by the Pulse of the Members.

In Pains of the Head, the *Pulsus brevis rarus* is fatal; if natant and frequent, it indicates, that Wind is the cause of the Disease, and may be easily cur'd.

In want of Speech produc'd by Wind, the *pulsus tardus* and *natans*, is a good sign, *celer plenus magnus frequens*, indicates Death.

*Interior plenus pulsus*, indicates Pains of the Stomach, and Belly, and fulness, and the Heart is drawn downwards; there is a vomiting Motion, Heat in the Hands and Feet.

*Pulsus profundus debilis*, indicates small Wind and Stools, and it is fatal.

If *Exterior* be the Repletion, inward Heat and Vomiting; if the Pulse be exundant and great, 'tis incurable.

If a *vacuum* be inwardly and outwardly, it indicates coldness of the Body, the Body sweats great Drops; they Vomit a little, the Pulse is wanting, the Body dies with Inquietude, looks Ghastly, and falls away, and the Blood grows thick.

The Pulses great and quick, are of hard Cure.

If malignity of the Spirits appears in the Superficies, and the Tumors fall; if the Pulse be natant and quick, 'tis Curable; if the Pulse be *subtilis*, it indicates a difficult Cure.

In

In a malignant Disease, when it appears in the Belly and Stomach.

If the Pulse be *subtilis*, 'tis of some hopes; if *natans magnus*, 'tis dangerous when golden Spots appears in the Skin, it indicates Plenitude; if the Pulse be *vacuus subtilis*, 'tis hopeful; if quick, great and frequent, 'tis dangerous.

All Pulses in the third place *Che*, and the first *Can*; if intense and frequent, indicate Vomiting to be increas'd, and proceed from Worms.

If Poison be within, and the *Pulsus* is *exundans magnus*, 'tis signs of Recovery; the *subtilis, parvus*, 'tis a sign of Death.

If the Pulse be once at quiet, the *circulus vitæ* is broke; but as long as it continues, the spiritual Soul and Body is united.

An empty Pulse shews small Strength, affliction of the Head, Wind, Noise in the Ears, coldness in the Extremities; the empty Pulses and *vacuus* are *subtiles molles, tardi, debiles*; they indicate the same as empty Pulses, and want of Blood, softness in the Flesh; the remiss and empty Pulses are slow and languid.

The full Pulses are frequent, exundant, great, indicate Wind, Heat, full Blood, Pain from Motion, intercepted; the full

and frequent Pulses are signs of cold Wind, and Heat with moisture; this is an Anguishness.

All manner of sensible *Phænomena* are observ'd by the *Chinese* in their judging of Diseases, and their Prognosticating concerning their Event, as well as by the Pulses.

All the Colours they deduce from the Liver, that is, the Blood, the Heart governs the Odors, and Fœtors; and by the Heart is understood the choleric Blood, for all hot Constitutions hate Fœtids.

The Pulse *natans crebro-acutus celer intensus*, happen in any long Disease; they are easily cur'd.

The Stomach or Chyle makes the Tastes, the Lungs govern Sounds, the Bladder Liquors, and Humours.

Moderate Pulses in all the three places indicate a good Constitution, and unequal deficient Pulses Death; if the Pulse be *vacuus*, and *raro obtusus*, the Disease is long; if *vacuus* and *crebet*, or *vacuus* and *remissus*, they die.

If *vacuus chordæ extensæ similis & celer*, it indicates Madness and Death.

In three places, if the Pulse be *solidus, plenus, magnus*, 'tis fatal.

If *solidus crebro-acutus*, and the Disease be long, 'tis hopeful; if *solidus remissus*, they recover; if *pleno solidus* and *intensus*, it indicates Life; if *plenus intensus*, and *celer*, 'tis a curable Madness; if violent in three places, 'tis malignant, it indicates Death.

The *Pulsus subtilis* and *mollis* in three places, in a long Disease indicates Life; and the same if it be *subtilis* and *frequens*, small and intense, Death.

### *The Cure of Diseases by the Chinese.*

All the Employment of the *Chinese* Doctors, is to know their Diseases by the preternatural Pulse, and to Cure their Excesses and Defects by simple Medicines of some particular Tastes, which they describe in their Books.

The Pulse in the *via Cordis* is exundant in Health; this is the Pulse of the choleric Constitution; but if the Pulse of the Liver invade the *via Chordis*, the Pulse is *chordæ tensæ similis*; the Heart is said to be hurt by a Wind, and this Pulse is a sign of less Heat than the exundant; and this is call'd *vitium vacui*, in respect of the Heat, not of the Vessels; if the slow and remiss Pulse of the Stomach enters  
into

into the *via Chordis*; this indicates the *vitium repletionis*; by diet and weariness the Heart is oppressed by superfluous *humidum radicale*.

If the *profundus pulsus* enters into the Heart, the Heart is overcome by much *humidum radicale* and coldness, and then the Water extinguishes the Fire.

In the *vitium vacui* the Heat begins to abate; in the *vitium repletionis* the Heat is oppressed, and in the *vitium latrocini* the Heat is extinguish'd.

If the Pulse of the Lungs enters into the way of the Heart, it indicates *vitium exiguitatis*, which depends on Cold, that is, the *exundant* Pulse becomes *natant*, which is produc'd by less Heat, and is caused by Cold in the Heart, as in a Malignant Fever, or want of Spirits.

If the *exundant* Pulse be more intense or remiss, 'tis called *vitium rectitudinis*, and this returns to a mediocrity of it self.

The *Chinese* cure these Pulses thus, the want of the *Calor primigenius* must first be restored, and then the *humidum radicale* abounding must be evacuated, and if the *humidum radicale* be wanting, and the Heat exceeding, we must first restore the *humidum radicale*, and after evacuate the Primigenial Heat; and so we reduce these

these causes of the Pulses to an equality, and the harmony of the Motion of the Blood and Spirits will return.

These Pulses depend on the *Calor primigenius*, the *exundans*, *intensus*, *natans*, *chorde tense similis*, *magnus*, *celeris*, *pleni frequentes*, *solidi longi*; the exceeding quality of this Heat must be cool'd, or well temper'd, and thereby reduc'd to its natural degree, and equality with the *humidum radicale*.

These Pulses depend on the *humidum radicale*, *profundus*, *cadens*, *varius*, *remissus*, *languidus*, *rarus obtusus brevis*, *tardus*, *interruptus*, *angustus*, *tenuis*, *mollis*.

The excess of the *humidum radicale* must be cur'd by evacuating the quantity, and correcting the quality; that is, the coldness.

For the 7 exterior Pulses, or the exceeding Pulses, the *Chinese* evacuate; for the interior Pulses, or the deficient, they restore and sweat; and this is the old Methodists, *est strictum* and *laxum*.

The quick and many Pulses must be cur'd as hot Pulses, the slow and few Pulses as the cold.

If the Pulse of the *Vesica* invades the Pulse of the Liver in the Spring, the Liver has the *vitiâ vacui*, we must restore  
the



the Mother, that is, the *Vesica* ; if the Pulse of the Heart, which is the *exundant*, invade the *via vesica*, 'tis *vitium repletionis*, therefore we ought *filium purgare*, purge the Heart ; if the Pulse of the Stomach invades the *via vesica*, 'tis *vitium exiguitatis* ; if remis or intense, 'tis easily cur'd of it self.

The *Chinese* use evacuation by Sweat, Vomits, Purges ; but they use no evacuations by Bleeding, because they say the boyling of Water in a Vessel is not cool'd by taking some of it out, so well as by putting in cold Water ; and they express the alteration of Humours by inducing the quality of Fire or Water into them ; they say, 'tis the Physician's Art to purge the Blood, to temper the Spirits ; and they make two kinds of Cures to evacuate, or restore.

The *Chinese* never inspect the Urine, nor use Glysters, Cuppings, Epithemes, Unctions ; they are their own Apothecaries ; make Decoctions, Pills, Powders, and prescribe a very thin Diet of boyl-ed Rice, lest it should hinder the Operation of their Simple Medicines, which they continue till the natural Pulse returns.

The inequality of the Elements are said to produce Diseases, these Qualities are the Cacochymias, the hot and the cold, which alter the Pulse, and the Diseases of the Pulse are the fulness or emptiness of the *Calor primigenius*, or the *humidum radicale*, which are only other Words for exceeding and deficient Rarifications of Blood and Spirits.

The *Chinese* have particular Medicines for each Pulse *ad extra*, and *ad intra*, which they have long experienc'd.

The *Chinese* have describ'd their Medicines by their Tastes, of which I will give the following Catalogue, as the Tastes are mentioned in *Cleyer*.

1. The Acrids which are Aperatives.

*Acorus*, which is of an Acrid Taste.

*Agallochum saporis acris. Cinnamonum acrodulce. Zinziber saporis acris. Nitri genus amaro acre. Valde frigidum. Bituminis genus acre tepidum. Caris ophyllum acre tepidum.*

Some Plants *salso acria temperata. Ricinus est fabarum genus saporis acris tepidum continet magnum venenum.* By this Observation we observe that poysonous Plants have a great Acrimony.

2. The Bitters are *Hepatics*.

*Radix amara subfrigida cichoreum. Radix amara dulcis frigida. Flos sub amaro dulcis temperatus. Radix acido amara subfrigida. Radix amaro-acris sive acro amara absinthium.*

*Radix salso amara subfrigida. Radix amara & acida dulcis subfrigida.*

*Semen raphani acre tepidum. Camphorra acris saporis & amori.*

*Myrrha acro amara. Nucleus mali perfici amaro dulcis.*

3. Salt Tastes, *Ophthalmics*, *Diuretics*, *Aperative* for the *Menstrua*.

*Radix salso dulcis subfrigida. Marinus lapis acro salsus frigidus tepidum. Salso acre tepidum, fructus amaro dulcis salsus & frigidus.*

*Canori genus salsum Cornu cervinum salsum tepidum. Anguis dulco salsus. Ostreae salse ovis Cornu amaro salsum frigidum.*

*Note, That many Plants salso acrum are venomous, and so are the amara salsa frigida.*

4. The *Acids*, *Acerbes*, cooling *Stypticks*.

*Sulphur acidum valde calidum. Ærugo rasilis amaro acerba. Ælumen acidum frigidum. Semen acidum temperatum. Mali Cotonei radix acido tepida. Cortex pomorum punicorum. Acido acer-*

*bus, cortex auriaci pomi acido-amarus. Aurantii cortex acri amarus. Rhinocerotis cornu amaro acidum salsum frigidum.*

*Note, That the Aromatics are comprehended under the Acrid Tastes, as well as the Corrosives, the Styptics under the Acerbes.*

5. The sweet Tastes are the Pulmonics. *Liquoritia is dulcis temperata. Scorzonera is dulcis temperata. Semen acro dulce temperatum. Radix acido dulcis semen amaro dulce sub frigidum. Coriza dulcis sub frigida. Salso dulce temperatum. Equisetum sub amora dulce. Cupressi resina amaro dulcis. Cupressi liquor dulcis temperatus. Ejus glans saporis. Acro dulcis, cortex amarus frigiaus. Thus amaro dulce. Folia arundinum amaro dulcia. Lapis amaro dulcis. Lapis instar cretæ dulcis frigidus. Scorpio acri dulcis temperatus.*

6. The last Taste which I take to be the *fatuus* of the *Grecians*, or watery mucilaginous, the *Chinese* call *insipidum frigidum radix subdulcis Insipida temperata.*

These are the Tastes by which the *Chinese* describe their simple Medicines, whether they be Vegetables, Minerals, or Animals; and in the description of these

these Simples they are as curious as *Galen* was ; and since both *Greeks* and *Chinese* approve of the descriptions of the sensible Tastes and Quality of the Medicines, I hope this Learned Age will pursue the same Method, and improve what I have begun, in the classing of them by their Tastes.

If any one should object, That the *Chinese* Expression are not Symbolical, let him literally Interpret this, *Si fuerit oriens repletus & occidentis evacuatus necesse, erit restaurare boream & evacua-re Austrum* ; the plain sense of this is, If the Liver which respects the Element of Trees which grow in the East be full, and the Metals which grow in the West, signifie the Lympha of the Lungs, and that be evacuated, we must purge the Fire of the South, that is, the Choleric Blood, which is usually signified by the Heart, and that respects the Element of Fire ; and we must restore the North, and that is, the Serum of the Blood. In short, 'tis thus, If the Blood be very hot, and the Lympha of the Lungs too dry or viscid, we must cool and dilute the Humours.

If any object, That the Members must not be interpreted by the *Cacochymias*, but literally, I will give this Quotation to prove it, *Cum via vesica ingreditur hepar, lacrymarum aquam producit; cum ingreditur Cor sudorem, cum ingreditur Stomachum salivam nimiam, cum ingreditur pulmones mucum nanum multum, in se vero urina aquam*; Is it not evident that the Serum of the Blood by its Secretion produces the Tears, Sweat, Saliva, *Mucus* in the Lungs, and Nose, and Urine? Then the *Chinese*, by the *via vesica* and its Pulse, describe the serose *Cacochymia*; and the reason why they joyn the great Intestines as an Appendix to the Lungs, is because of their Mucus and Wind, which is like that in the Lungs.

I must beg your leave, before I conclude, to reflect on the Antiquity of this Art of feeling the Pulse, which seems to be deriv'd from *Noah*, because the *Chinese* derive it from their first Kings, 2600 years before our Saviour; they have this Art by Tradition, as well as the Notion of the Circulation, because their Books give no other account of it, nor reason for it, but that they received them from their Predecessors; and it is an excellent  
 Custom

Custom that the *Chinese* never change their Language, Laws, Philosophy nor Habits; and this has occasioned their preserving the old Morality, the old excellent Constitution of Government, and their old Doctrines about Natural Philosophy, which they received from the Primitive Fathers who lived 300 years, in which time they improv'd most Arts; and the *Chinese* have most faithfully preserved the Tradition of those Arts; from the *Caldeans* and *Egyptians*, the principal parts of all our Arts are by Tradition deriv'd. Upon those old Foundations, Posterity has built many Hypothesis to entertain every Age with some Novelty; and if this Age had not the Traditions of the old Arts, we could not have now improv'd them; by clearer Explications or Additions to the Fundamental Tradition, not only Physick, Musick, Poetry, Architecture, Geometry, were discover'd at first by some Inspiration to the Inhabitants before the Flood; but also the Religious Worship, by Prayer, Sacrifice, Purifications, had a Divine Revelation at first. I will give this farther Instance of the Antiquity of this Art, and that is, because it's deliver'd in a Symbolical way, as the old *Egyptian* Learning was. This

is probably their Method of concealing their Learning from the Vulgar, because the *Chinese* have no Learned Languages, as the *Europeans* have; and, I believe, the Discourse of their Doctors is this mystical Cant.

S I R,

“ I Have only reserved my self room  
“ to return Thanks for the Favour you  
“ have shewed to me, who am unknown,  
“ but am very sensible of the Service you  
“ have done my Subject, by the Book you  
“ lent me.

Sir,

Your very much oblig'd Friend,

Golden-square, and humble Servant,  
Jan. 1. 1726.

JOHN FLOYER.



I have finished what I designed about the Art of Pulses, and the Reader, who will imitate the *Galenic* Art, must attain the knowledge of different Pulses, and the natural Magnitude, and its Excesses by a long Experience; but if the Reader desires to imitate the *Chinese* Art, he must have a very curious Sense of Feeling; and he must spend a long time in observing of the Pulse, and he must learn the *Chinese* Symbolical manner of expressing of himself about the Pulses; for 'tis not easie to separate the *Chinese* Notions from their Practice.

The Art of feeling the Pulse, which I have propos'd for distinction sake, I will call Mechanical; 'tis short, easie, and more certain than the *Galenical* or *Chinese* Art, because it requires no more than counting of the Pulse, and observing the time by the Pulse-Watch; this will shew the Diseases of the Fluids, that is, of the Blood and Spirits; and the Method to raise or sink the Pulse; and by the same Method the Circulation will be stopt or accelerated; and he who knows and can best regulate the Excesses or Defects in the Pulse, and Circulation (as I conjecture) in the Learned Ages which are to come, will be esteemed the best Physician;

fician: *Galen* got all his Reputation at *Rome* by his Prognostications grounded on his knowledge of the Pulse. He obtain'd the Emperor's Favour by feeling his Pulse, and discovering by its Contraction, that he had no Fever when all his Physicians affirm'd that he had; he only prescrib'd him some Wine and Pepper for the Crudity of his Stomach, and *Ung. Nardinum* outwardly, by which he was cur'd; this free way of his Physician *Commodus* highly commended, as the chief Duty of a Physician, and that it was peculiar only to Philosophers, and not to those who are lovers of Money and Glory.

*Galen* knew a Quartan by the Pulse in *Eudemus*, and forbid the use of *Theriaca* till after the Concoction, because it would double it.

*Galen* discover'd that *Cyrellus* did eat privately, by his Pulse.

*Galen* discover'd that *Commodus*, when a Child, had an Inflammation after Exercise in some part, which afterwards appear'd in the Tonsils.

*Galen* told the Crudity in a Fever by a frequent Pulse, and the end of a Quartan by a high Pulse, which is a sign of a Crisis; by this Rule he knew that *Antoninus's*

*toninus's* Son *Sextus* would not be cur'd by a Crisis on the 6th day, but would recover on the 17th.

The Pulse shews the Crisis, and if the Constitution be hot, and the time of the Year so too, the Crisis will happen by evacuations ; but if the Pulse be weak and slow in cold Seasons, and cold Humours after long Fevers, *Galen* prognosticates Abscesses ; and this is also his useful Observation ; if the Pulse be good we need not fear any ill signs ; if the Pulse be bad many ill signs will not signify a recovery. And that I may have *Galen's* Authority to justify my distinctions of the hot Cacochymias, I will give this Quotation from his first Book of his Comment on *Hipp.* Predictions, ἡ ξανθή, χολή ἡ πρώτη ὀπταμένη πρῶτον μὲν ἐν τῷ ἰώδῃ ἰρέπειται γυμνόν, ἔπειτα, εἰς τὰ μέλανα. This is agreeable to my Scheme, Choler is the first hot Humour, the *Æruginose* the second, and the *Atrabilis* the hottest ; *Galen* foretold a Crisis by the Pulse, and that a Hæmorrhage would happen in the right Nostril, which gave him great Reputation. *Severus* recommended him to *Marcus Aurelius Antoninus* the Emperor, and *Lucius* his General, was his great Friend.

I will

I will conclude with this Remark of *Isaac Vossius*, *A temporibus Galeni nihil huic scientiæ accessit quin potius si verum futeriliceat adeo diminuta est, ut vix aliquem hoc seculo invenias Medicum, qui observata Galeni vel intelligat vel curet.*

Since 'tis objected by the Moderns, That the *Chinese* are Ignorant in Philosophy and Anatomy, and therefore their Pretence to the Knowledge of the Pulse is Cheat and Imposture; to this I have already answer'd, That many judicious Travellers do positively assert, that they have this Art; and I have already describ'd it, and I desire the Reader to consider these Things which evidently manifest their Art.

All Arts are grounded on a long Experience, and the *Chinese* have had above 4000 Years Knowledge in this Art, as appears by their old Book *Nuy Kim*; and they believe a Circulation from an old Tradition, tho' they know not the true Causes.

If any one should deny *Galen's* Art about the Pulses, I would desire him to read *Galen's* Tracts; and if any Person should deny the *Chinese* Art, I would desire him to read the Account of the old Book *Nuy Kim* in *Cleyer*.

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They have obscurely describ'd in their Symbolical way all the useful parts of this Art, as the Causes of the hot Pulses, *viz.* the primigenial Heat which the *Greeks* describe by the innate Heat; the *Moderns* by the Motion or Rarification of the red Bullule in the Blood.

The Causes of the cool Pulses, the *Chinese* impute to *humidum radicale*, which the *Greeks* call the phlegmatic Humour; the *Moderns* the Serum of the Blood, or watery, white, inactive Bullulæ, I would plainly ask whether the Art of the Pulse is not the same, whether we call the Causes by the *Chinese*, *Grecian*, or *Modern* Names? The different Names or Hypothesis are fram'd and built after divers Experiments have been try'd, and Matters of Fact clearly observ'd; and the Hypothesis is always adapted to the natural *Phænomena*, and we may Practice by the *Chinese*, as well as the old *Grecian* Notions; the Antiquity of the *Chinese* Art must excuse the crudity of their Notions, but they are deliver'd in the short Aphoristical way that *Hippocrates* writ his Art; and this makes it more obscure, as well as the Ignorance of the Persons who give a confus'd immethodical Account of the *Chinese* Art.

The *Chinese* describe the different Pulses of the Sex, Habit, Seasons, Constitutions, Climates, Ages.

The *Chinese* describe the Alterations of Pulses by internal and external Causes, Heat, Cold, Wind, Humidity, Moisture, which produce the Pulses *ad extra*, or *ad intra*.

The *Chinese* observe the Heat in the first place of the Pulse, which the *Greeks* call the hot choleric Cacochymia; and the cold or watery is in the third place of the Pulses, which the *Greeks* call the phlegmatic Cacochymias; and in the middle place stands the sanguine moderate Temper of Blood, which has a moderate degree of Heat and Moisture; by the places of Heat they discern that the Blood circulates too fast; and in the place of Cold the Pulse discovers that it circulates too slow.

By these different places of the Pulse, they discern to which Region the Circulation tends; and by the different pressure they discern the force of the Heart to carry the Blood more inwardly, or in the great Vessels, or more externally through the capillary Arteries of any part, by which may be known in what part the Cacochymia fixes.

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The Cacochymias they describe by their natural Pulses, the mixture of them by the mix'd Pulses; they observe the different Colours in the Face, in the Cacochymias, and the different Tastes of the Humours, and different Odors, and all the external Inditia obvious to our Senses, to confirm their Judgment by the Pulses.

They describe the Indication in several Diseases by the Pulse, and are extremely nice in their Prognostications by them; it has been the Misfortune of many old Books to be too nicely explain'd, and abus'd by the Alteration and Additions of Commentators; 'tis probable that the Moderns have added all the extraordinary Prognostications, and which seem'd Incredible; but if upon our trying of these by a long Observation we find them true, this will confirm us in a better Opinion of the *Chinese* Art; it is not fit for any Person to reject Matters of Fact, till by Experience he finds them to be false. If I could fully describe this Art by unrid- dling all the obscure Symbols of it, we should very much admire the long Expe- rience of the *Chinese*, as well as their in- genuous Project of measuring the Num- ber of Pulses by the Number of Respira- tions.

tions, I hope all I have said will occasion the Reader to suspend his rash Censure, that the *Chinese* have not the sphugmick Art they pretend to; 'tis possible that 'tis now exercis'd by ignorant Practisers, and 'tis now reported to us very unskilfully by those *Europeans*, who never understood the *Galenick* Art about the Pulses. I find that the Learn'd *Isaac Vossius* has been hardly us'd for the favourable Report he has given of the *Chinese* Art; but this may be said for him, that he has not asserted more about that Art, than may be found in *Cleyer's* Specimen, which was Publish'd before *Vossius* writ; and since that Learn'd Person took his good Opinion of that Art from *Cleyer's* Book, I cannot be thought singular in my Explication and Approbation of that Art; but in this Particular I must differ from *Vossius*, that *Avicenna* had some Knowledge of the *Chinese* Art by the *Chinese* Inhabiting *Cathaya Nigra*; since what *Avicenna* has writ is a perfect Transcript from *Galen's* Books, and has nothing like the *Chinese* Art; neither have the *Arabians* improv'd either the Notions or Experience deliver'd by *Galen*; the *Chinese* Art may farther be discern'd by their nice Computations.

The



The *Chinese* reckon in 24 Hours at least 54000 Pulses, and in a quarter of an Hour 562. If this Calculation be just, the *Chinese* will have at least in a Minute 37 Pulses.

The *Chinese* reckon at most in 24 Hours 67500 Pulses, and in a quarter of an Hour 703 Pulses, and then there will be in a Minute 46 Pulses; according to this Computation, the Latitude the Pulses run must be nine Beats, and the most healthful Pulse must be 42 in a Minute.

The *Chinese* say, That in 24 Hours, there are Respirations 13500.

In a quarter of an Hour there are 150 Respirations, and four or five Pulses are reckon'd to every Respiration. To nine Respirations the *Chinese* allow from 45 to 50 Pulses in good Health.

*I will add these Remarks upon the Chinese Computations.*

At *Peking* there is Ice, and great Cold, as *Kao*, a Native, relates in his Description of *China*: In other Parts the Air is Temperate, and in the Southern exceeding Hot; if so, none of the Computations of the Pulses can be true; if the

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Pulses

Pulses of the Climates answer to the Pulses of the Seasons, in cold Seasons and Climates very rare Pulses, in the hot very frequent are observ'd. In the cold Northern Parts of their Latitude, the number of Pulses ought to be according to the different degrees of Heat and Cold observ'd in my Table of Climates; but since by the Account the *Chinese* give of their Pulses, their Numbers are less than ours; 'tis plain, the Pulses becomes more rare in hot Climates; what Alterations must be allow'd in Pulses by the profuse Sweats in hot Climates, nothing but a farther Experience can determine; whether that does make the Pulse more rare, as all Evacuations do; or whether the ambient hot Air makes the Pulses more frequent, tho' weaker; if a Journal were kept of some healthful Pulses every Morning by the Minute-Glass, thro' a Voyage from *England* to the *Æquator*, this Difficulty would be easily decided.

*A Table of the Healthful Pulses in each Climate, supposing that excessive Heat make the Number of Pulses become more rare, by evacuating the native Heat.*

| Pulses in a Minute. | Æquator.           |
|---------------------|--------------------|
| 20                  | Under the Line.    |
| 25                  | 5 Degrees from it. |
| 30                  | 10                 |
| 35                  | 15                 |
| 40                  | 20                 |
| 45                  | 25                 |
| 50                  | 30                 |
| 55                  | 35                 |
| 60                  | 40                 |
| 65                  | 45                 |
| 70                  | 50                 |
| 75                  | 55                 |
| 80                  | 60                 |
| 85                  | 65                 |
| 90                  | 70                 |
| 95                  | 75                 |
| 100                 | 80                 |
| 110                 | 85                 |
| 120                 | 90                 |

The Latitude of *China* is from 18 degrees of Latitude to 40, and then the Latitude

itude of their healthful Pulses will be from 37 to 60, but they reckon from 37 to 46 in a Minute; how far these Observations will be useful to Geography, a farther Experience will shew. *Peking* is near 40, and there the healthful Pulse will run 60, according to my Computation.

Whether this Table made by supposing the Pulse sinks, as we Travel toward the *Æquator* be true, or that which is made upon Supposition that in the Southern Countries the Heat does raise the Pulse to a greater frequency, I cannot certainly determine; but by the *Chinese* Calculation of their number of Pulses in one Day, this Table seems probable. And it is of great Moment in Physick to calculate the Tables of Climates aright, because these Rules of Practice depend on it.

If hot Countries will sink the Pulses to more rarity, we ought to send our Patients, who are of hot Constitutions and hot Diseases (such are the Consumptive) into the hotter Climates; and if our Pulses run too low and rare, as in ferous cold Constitutions, we ought to send such Patients into colder Countries.

In hot Countries, they use a hot Diet and hot Regimen to support the Pulse,  
and

and loss of Spirits ; in cold Countries, the Pulse exceeds by stopping in the Perspirabile, and a cool Regimen preserves the closure of the Pores, and tempers the inward fiery Heat.

Because the Indications of the *Chinese* Pulses seem somewhat obscure, I will give the following short Explication.

The Pulses *ad Extra* shew, That the Circulation runs too fast, and then produce different Effects or Symptoms in different Parts or Regions of the Body.

1. In the Head or Lungs, or Breast ; these effects Heat, Pains, hot Winds, Inflammation in the Eyes, Throat, Deafness, Defluxions, Thirst, Delirium, Convulsions, Dyspnæas, Coughs, Hæmorrhagies, Pains in the Breast, Garrulity, fætid Breath.

2. In the Region of the Stomach, Liver or Spleen, these Symptoms are observ'd in a quick Circulation, Nauseousness, Vomiting, Pain at the Stomach, *Nidorous Ructus*, or hot Winds, Cholera, hot Tumors, Obstructions.

3. In the Region of the Reins, Loins, Legs, *Uterus*, Skin, these Affections, defect of Urine, or Suppression, Dysury, hot Cholics,

lics, stop of the Menfes, Rheumatic Pain and Lassitude, or hot Tumors of the lower Parts, Dryness and Heat in the Skin.

The Pulses *ad Intra* shew, That the Circulation runs too slow.

In the Region of the Head and Lungs they produce these Diseases, Dizziness in the Eyes, Noise in the Ears, debility of Spirits, Fear, Sadness, Obstruction in the Nerves.

In the Region of the Stomach, Liver or Spleen, cold Wind, Pain, Indigestion of Meats, Pain and Sickness at Stomach, Vacuity.

In the Region of the Reins, Loins, Belly, and all the lower Parts, Cold in the Extremities, Stupors, Obstructions, debility of Motion, Heaviness, watery Tumors, pale Urine, cold Winds, heaviness in the Reins, flux of the Belly, want of Perspiration, cold Sweats, *Fluor Albus*.

When the Blood circulates freely, or in an exceeding manner, the hot sanguineous Parts which are near the Heart, or great Vessels suffer first; such are the Muscles of the Heart, the Lungs, and Breast, the Liver, Spleen, and common Muscles; the cold Parts are more remote from

from the Heart, or receive less Blood, but more of the Limpha; and these suffer first in a weak and slow Circulation; these cold Parts are the Bones, Cartilages, Nerves, Membranes, Brain, Fat, Skin and Hair, all Glands of use to the Serum.

|   |   |        |
|---|---|--------|
| If the Pulses in <i>England</i> be in a | } | 70     |
| Minute.                                 |   |        |
| In a quarter of an Hour there           | } | 1050   |
| will be                                 |   |        |
| In an Hour,                             |   | 4200   |
| In 24 Hours,                            |   | 100800 |
| For 70 Pulses in a Minute there are 14  |   |        |
| Respirations.                           |   |        |
| In 24 Hours, <i>Respirations,</i>       |   | 20160  |
| In an Hour, <i>Respirations,</i>        |   | 840    |

I hope these surprizing Numbers will produce the same Reflexions in the Reader, as I shall now make, That nothing but an infinite wise God could contrive such perpetual and numerous Motions, as the Pulse and Respiration have in one Day; and it requires the Providence of the same wise Creator to preserve 'em all the Days and Years of our Lives: Our Lives are  
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measur'd by the Number of our Pulses, the first Pulse begins Life, and it ceases with the last; if the Number of one Day be wonderful, the many Millions which will happen in One Hundred Years, ought to be reckon'd among the greatest Miracles of the Creation.

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